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**EVIDENCE-BASED PHYSICAL ACTIVITY INTERVENTION: LESSONS
FROM AROUND THE GLOBE**

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30 **SUMMARY**

31

32 Promoting physical activity has become a well-established priority for health agencies at
33 all levels. A secondary literature search focusing on evidence reviews from 2001 through
34 2011, identified effective, promising, or emerging physical activity interventions from
35 across the world. Recommended interventions include: *campaigns and informational*
36 *approaches* involving community-wide campaigns, mass media campaigns, and short
37 physical activity messages targeting key community sites; *behavioral and social*
38 *approaches* involving social support for physical activity within communities and
39 worksites, school-based strategies that encompass physical education, classroom
40 activities, after school sports, and active transport; and, *environmental and policy*
41 *approaches* of creating/enhancing access to places for physical activity with
42 informational outreach activities, community-scale and street-scale urban design land
43 use/planning, active transport policy/practices, and community-wide policies and
44 planning. In summary, there exist a significant number of approaches that demonstrate
45 an acceptable level of effectiveness for increasing physical activity across different ages,
46 social groups, and countries/communities across the world.

47

48

Key Messages

- *Communities increase their effectiveness in promoting physical activity where health agencies partner and coordinate efforts with community organizations, including schools, businesses, planning and transport agencies, healthcare organizations, and recreation agencies*
- *Campaign and informational approaches to promoting physical activity that are effective include community-wide campaigns, mass media campaigns, and short physical activity messages targeting key community sites*
- *Physical activity promotion efforts that involve increasing social support for physical activity within communities, specific neighborhoods, and worksites are effective in increasing levels of physical activity among community residents*
- *School-based strategies that encompass physical education, classroom activities, after school sports, and active transport provide evidence for promoting physical activity among school-aged children and youth*
- *Environmental and policy approaches provide evidence for increasing physical activity across many global communities through: creating/enhancing access to places for physical activity with outreach activities; infrastructural interventions such as community- and street-scale urban design land use/planning; active transport policy/practices; and community-wide policies and planning.*
- *For an effective global strategy for the promotion of physical activity, we must achieve a workforce that is trained in core public health disciplines and methods of inter-sectoral collaboration.*
- *From an international evidence-based perspective, while there is a place for informing and motivating individuals to adopt physical activity, the public-health protection and promotion role in ensuring that environments are safe and supportive of health and wellbeing should be the priority for promoting physical activity.*

50 **THE IMPORTANCE OF PROMOTING PHYSICAL ACTIVITY IN**
51 **COMMUNITIES**

52 Scientific guidelines issued by various international bodies, national centers/institutes,
53 and professional organizations have documented that regular physical activity protects
54 against coronary heart disease (CHD), type 2 diabetes, selected cancers, hypertension,
55 obesity, clinical depression, and other chronic conditions.¹⁻⁶ These findings have been
56 reiterated in a recent international systematic evidence review authored by Lee, et al.⁷
57 Therefore, the significant potential benefits for whole populations and at-risk individuals
58 through promoting physical activity has become a well-established agenda for public
59 health agencies and healthcare delivery systems at all levels throughout the world.

60

61 Historically, the primary roles for public health agencies and non-governmental
62 organizations at the international, national, state, and local levels have been to monitor,
63 protect, and promote the public's health.⁸ These functions have been intended to
64 complement the contributions of healthcare delivery systems and other community
65 sectors in bringing about effective prevention, control, and management of diseases and
66 chronic conditions.⁹ In recent decades, the focus of public health has expanded to include
67 initiatives involving interventions for injury prevention and control, chronic disease
68 prevention and management, health-promoting public policies, environmental supports
69 for behavioral change, and broad-reach interventions through health communication and
70 media.¹⁰ Interventions to increase physical activity in whole populations are now
71 prominent among these contemporary public health initiatives, where interventions

72 include community-based informational, behavioral, social, policy, and environmental
73 approaches to promoting physical activity.^{11, 12}

74

75 It is acknowledged that community-based health promotion – when seeking to promote
76 physical activity at national, state/regional, and local levels – can only be successful and
77 have its greatest reach through inter-sectoral collaboration.^{13, 14, 15} Public health agencies,
78 in particular, need to partner with community organizations, including schools,
79 businesses, planning and transport agencies, healthcare organizations, and recreation
80 agencies,¹⁶ to plan, promote, and coordinate efforts to increase physical activity.¹⁷

81 Critical functions of public health agencies in these efforts include: ensuring that
82 strategies to reduce health inequities in physical activity are implemented; monitoring the
83 effectiveness and reach of physical activity interventions; and, reporting of routine
84 program evaluation to the relevant stakeholders and partners.¹⁸

85

86 **SEARCHING FOR PHYSICAL ACTIVITY INTERVENTIONS THAT WORK**

87 Here, we summarize representative evidence-based physical activity interventions from
88 across the globe that are linked to a broad understanding of health promotion and disease
89 prevention at the national, state/regional, and local levels. To do so, a secondary search of
90 the literature, focusing on representative existing evidence reviews from throughout the
91 world, was conducted to identify effective, promising, and emerging physical activity
92 interventions. Further examination of internationally-represented evidence-based
93 programs was also carried out to supplement the search. This “review of reviews” was
94 carried out to assess the current level of evidence. Details of the literature search

95 methods employed are provided in the Appendix, Panel #1. A summary table is provided
96 summarizing the search results by setting (e.g., school, worksite, community and health
97 care.), total number of original reviews examined, years of publication of studies
98 reviewed within the original reviews, total number of studies covered within the original
99 reviews, countries represented across all reviews, type of systematic review conducted ,
100 and whether race/ethnic minorities and/or lower socioeconomic populations were
101 included in the studies originally reviewed. (See Table 1)¹⁹

102

103 Building on the concept of an evidence typology described by Brownson et al.,^{20, 19}
104 evidence-based intervention strategies were selected using criteria prescribed by each of
105 the systematic reviews, in order to yield categories of intervention effectiveness. These
106 categories included:

- 107 1. Evidence-based interventions to promote physical activity
- 108 2. Promising practices from recommended programming
- 109 3. Emerging intervention strategies that have been evaluated, peer-reviewed, and
110 recently published.

111 Each of the selected interventions is presented through the use of a summary table that
112 includes a supporting citation, brief description of the intervention, and a subjective
113 rating based on effectiveness as defined by the original review. (See Web Table 1)
114 Measures of effectiveness are derived directly from the cited evidence-reviews. For the
115 purposes of this paper, the intervention strategies have been classified using the domains
116 established by the Guide to Community Preventive Services (*The Community Guide*).²¹
117 These domains are used because they conveniently capture the majority of physical

118 activity intervention strategies delivered throughout the world and consist of descriptors
119 that are also found in other international physical activity recommendation documents.^{1, 2,}

120 ⁶

121 These intervention strategy domains include:

122 1. *Campaigns and Informational approaches* to promoting physical activity – these
123 are strategies aimed at changing knowledge, attitudes, and behavior about the
124 benefits of and opportunities for physical activity within a community.

125 2. *Behavioral and social approaches* are aimed at teaching people the behavioral
126 management skills that are necessarily for successful adoption and maintenance of
127 behavior change, and working through or creating organizational and social
128 environments that facilitate and enhance behavioral change.

129 3. *Environmental and policy approaches* that are aimed at structuring the physical
130 and organizational environments so that people have accessible, safe, attractive
131 and convenient places to be physically active.

132

133 Borrowing from the work of Roux, et al.,²² exemplary interventions from each
134 intervention domain were selected using the following criterion: an intervention
135 receiving a strong recommendation from the original review; represent at least one of the
136 three intervention domains; a controlled study of children, youth, or adult subjects
137 without established disease; provision of a detailed study protocol; availability of a
138 physical activity outcome measure; and a study duration of 3 months or longer. Excluded
139 were interventions that did not provide baseline and post-intervention effect-size data, a
140 comparison group, or a measurable effect-size metric.

141 **PHYSICAL ACTIVITY INTERVENTIONS THAT WORK**

142 Campaigns and Informational Approaches

143 **Community-wide campaigns:** A recommended strategy within this intervention domain
144 is community-wide campaigns.²¹ These campaigns represent large-scale, high-intensity,
145 high-visibility programming and often use TV, radio, newspaper, and other media to raise
146 program awareness, disseminate targeted/segmented health messages, and reinforce
147 behavior change. This strategy often employs multi-component, multi-sector, and multi-
148 site interventions. Community-wide exemplary interventions from this body of evidence
149 include the Stanford Heart Disease Prevention Program²³ and the Wheeling Walks
150 intervention.²⁴ Such interventions have proven to be effective primarily among selected
151 populations living in communities within middle to high income countries. These
152 findings are in contrast to reviews that did not include observational studies or studies
153 with insufficient evidence that are not necessarily ineffective, which have found
154 inconsistent evidence in support of community-wide interventions, especially among
155 communities in low to middle income countries.^{25, 26}

156 **Mass media campaigns:** Another informational approach that can produce physical
157 activity behavior changes in selected populations is mass media campaigns, particularly
158 when they are linked to specific community programming. Initially categorized by the
159 Community Guide as having ‘insufficient’ evidence, this intervention approach recently
160 has emerged as a promising public health practice.^{27, 28} This approach is represented by
161 the VERB™ campaign, which targeted ‘tweens’, young people ages 9-13, in
162 communities across the U.S. with mass media efforts, internet links, and community
163 events and programs designed to increase and maintain physical activity.²⁹ This

164 exemplary intervention was characterized by the use of multiple-media, segmented
165 messages, and links to community programming and has demonstrated effectiveness by
166 increasing the physical activity levels of young adolescents.³⁰

167 ***Delivery of short physical activity messages at key community sites:*** An example of an
168 emerging informational practice is the delivery of short physical activity messages at key
169 community sites. This approach has been used primarily in communities in Latin
170 America,²⁶ and is based on short physical activity-related educational and motivational
171 messages delivered regularly to the target population. This type of community
172 intervention was developed in Brazil and focuses on key community sites, including
173 worksites, senior centers, and community centers.³¹ It is distinct from mass media
174 campaigns in that the messaging is site-specific and often delivered by a health
175 educator/communicator.³¹

176 *Behavioral and Social Approaches*

177 ***Individually-adapted health behavior change programs:*** Individual health behavior
178 change programs are characterized by a multi-component intervention approach, with the
179 goal of having participants incorporate physical activity into their daily routines.²¹
180 Interventions that represent this strategy include goal setting, social support, behavioral
181 reinforcement through self-reward, structured problem solving, and relapse prevention.²¹
182 These interventions can be delivered in group settings or by email, internet, mail, and/or
183 telephone. Individual-focused interventions usually consist of an assessment of a
184 participant's physical activity level and readiness to change, a tailored activity plan, and
185 navigation to community interventions by a centralized health provider or promoter.³²

186 This approach, which focuses on lifestyle physical activity, has been shown to be cost-
187 effective when compared to supervised physical activity programs.³³

188 ***Social support interventions in community settings:*** social support in community
189 settings is an example of a strategy that capitalizes on social networks to reinforce
190 physical activity behavior. Behavioral and social approaches include creating buddy
191 systems, contracting, and forming walking or other physical activity support groups.²¹ An
192 exemplary intervention that represents this strategy, as reported by Kriska, et al.,³⁴ is one
193 in which women were organized into walking clubs within their neighborhoods and
194 received communications (e.g., newsletters, phone prompts) designed to reinforce and
195 sustain their walking network. Another example comes from the work of Lombard, et al.
196³⁵ who organized walking partners and small groups in communities. They conducted
197 initial training on walking and behavioral principles and provided neighborhood maps
198 and other supports. Phone networks and regular prompts and updates were used to
199 reinforce behaviors and provide opportunities for participants to ask questions.

200 Community settings can include worksites, community centers, health facilities, and
201 parks and recreational facilities. An exemplary representative intervention is the work of
202 Jeffrey, et al.,³⁶ who used personal trainers in a community center coupled with behavior-
203 based sessions, phone follow-up, and financial incentives to reinforce physical activity
204 behaviors. Using providers such as personal trainers for assessment and counseling for
205 physical activity is most often classified as a clinical intervention. However, this
206 approach also is relevant to the public health sector, because many public health agencies
207 continue to deliver primary health care.³⁷

208 ***Healthcare provider-based assessment and counseling for physical activity:*** Provider-
209 based physical activity counseling has undergone systematic review and still lacks
210 sufficient evidence to be recommended as single component intervention.³⁸ However,
211 when it is integrated into existing community efforts, this approach emerges as a
212 promising practice for physical activity promotion.³⁹ The recent review by Patrick et al.,
213 ³⁹ cited such sources as evidence reviews from the United States Preventive Services
214 Task Force (USPSTF), the Cochrane Collaboration, and the National Institute for Health
215 and Clinical Excellence (NICE, UK), as well as the published medical and psychological
216 literature and other relevant sources. Others have found that the evidence for health-care
217 provider assessment and counseling of patients for the promotion of physical activity is
218 mixed with brief stand-alone counseling by providers being shown not to be efficacious,
219 but office-based screening and advice followed by telephone or community support for
220 physical activity being effective in sustaining more long-term physical activity behavior
221 improvement among patients.⁴⁰ Thus, healthcare provider delivery models that
222 emphasize coordination with clinical and community resources may be the most optimal
223 in promoting physical activity among healthcare patients.⁴¹

224 ***Physical activity classes in community settings:*** Evidence from the effectiveness of
225 community wide physical activity programs are still emerging. However there is new
226 evidence on the promising impact of providing physical activity classes at the community
227 level to increase physical activity levels.²⁶ These programs offer fitness instruction and
228 aerobics classes for the population at no cost and often are carried out in public places
229 (e.g., parks, school yards, community centers, worksites, and common sports facilities).
230 Programs such as these provide social support and are of particular importance in places

231 with a deficit in recreational public parks and significant to underserved populations and
232 populations that are less likely to achieve physical activity recommendations. Such
233 populations include women, older adults and low SES people. Since these programs are
234 usually offered at no cost, they may also contribute to reducing social disparities and
235 health inequalities.²⁶ Various examples of this type of intervention can be found in cities
236 from Latin America and have been described by Pain, et al.⁴² in Sao Paulo, Brazil, Diaz-
237 del Castillo et al.,⁴³ in Bogota, Colombia and Simoes et al.,⁴⁴ in Recife, Brazil. These
238 types of efforts implemented guided physical activity classes (aerobics, stretching, yoga,
239 dancing etc) in community parks or plazas and in community centers from low to high
240 income neighborhoods. In addition, other educational and promotional materials are
241 provided for additional connection with each of the intervention communities.^{45, 46}

242 The primary characteristics of physical activity classes are: they are usually implemented
243 in work sites and community centers; they are offered to specific groups of people in a
244 community; they are conducted by trained instructors; and they make use of available
245 environmental resources within communities that support physical activity behaviors.

246 ***School-based interventions:*** A recommended strategy within the behavioral and social
247 domain is school-based physical education (PE). School-based interventions has great
248 potential to increase levels of physical activity among children because in many countries
249 PE is mandatory, which increases participation even among the least active children, who
250 are otherwise difficult to target through other programmatic efforts. School-based
251 interventions include programs delivered during school time as well as afterschool.⁴⁷

252 Some of the core components for effective school based interventions that have been
253 reported in the literature include: increased number (5 sessions of at least 45 minutes per

254 week) or improved quality of PE classes,²¹ increased physical activity during recess and
255 other subjects, capacity building and staff training, changes in the PE curricula, provision
256 of equipment and materials, and adjustment of the interventions to specific target
257 populations.⁴⁸⁻⁵⁴ Many studies are multi-component including diet interventions and
258 family based interventions and reduction of sedentary time.⁵⁵ Effects of school based
259 interventions have been evaluated using various outcomes such as physical activity level,
260 fitness, obesity, other cardiovascular risk factors, and wellbeing.^{56,57} Various studies in
261 high and middle income countries²³ and reviews have found that participation in school
262 based interventions increases children's levels of physical activity, and improves fitness
263 outcomes and motor skills, and reduces cardiovascular disease risk factors.⁴⁸⁻⁵⁴

264 *Policy and Environmental Approaches*

265 ***Creation of or enhanced access to places for physical activity combined with***

266 ***informational outreach activities:*** The interventions within this strategy consist of
267 creating/enhancing existing walking/biking trails or exercise facilities, and increasing
268 access to existing facilities by reducing structural and environmental barriers (e.g.,
269 increasing safety, enhancing affordability).²¹ These efforts are most often supported by
270 personnel and/or participant training, provision of social support, and further integration
271 of these structures, facilities, and programs into participant's communities. An
272 exemplary intervention is provided by Linenger et al.⁵⁸ where new infrastructure (i.e.,
273 bike paths) and access to facilities (e.g., expanded hours of operation, lighted and
274 integrated paths), and improved programming were provided to a residential Naval
275 base.⁵⁸ A more recent study⁵⁹ reinforces the findings from Linenger et al.,⁵⁸ by
276 demonstrating that the installation of clusters of fitness equipment in parks along with

277 promotional efforts about the fitness equipment, increases physical activity in parks
278 among children, youth, and adults.⁵⁹ Recent studies have documented that providing such
279 infrastructure is reasonable from a cost perspective.^{59,60}

280 ***Community-scale urban design and land use policies and practices to promote physical***
281 ***activity:*** Urban design and land-use regulations, policies, and practices commonly strive
282 to create more livable communities. These types of interventions use policy instruments
283 such as zoning regulations and building codes, and environmental changes brought about
284 by government policies or developers' practices. The latter includes policies encouraging
285 transit-oriented development, and policies addressing street layouts, density of
286 development, location of more stores, jobs and schools within walking distance of where
287 people live.⁵⁷ The body of evidence reported in this review by Heath et al.,⁶¹ included
288 twelve studies conducted within the United States and one study in Canada, where four of
289 these studies compared communities with grid/rectilinear street design with communities
290 with cul-de-sac street design.⁶¹ Three studies compared pedestrian friendly environments
291 (e.g., ease of crossing street, topography, continuity of sidewalks, etc.) with non-
292 pedestrian friendly environments. Among these studies the intervention and comparison
293 communities were similar in terms of socioeconomic status (SES) and racial/ethnic
294 parameters. In addition, within as well as between studies, there was a range of SES. The
295 NICE review addressing the promotion of physical activity through built or natural
296 environments provided further evidence in support of this intervention strategy outside of
297 North America.⁶² Given the diversity of countries and populations included in these
298 bodies of evidence, these results should be applicable to diverse settings and populations,
299 provided appropriate attention is paid to adapting the intervention to the target

300 population. Given that the studies reviewed were carried out in relatively dense, urban
301 environments, it is unclear whether the same components of design and land use apply to
302 rural settings, although many of the design features illustrated in this body of evidence
303 can be found in small towns/cities located in rural regions.⁶² There are potential barriers
304 to be addressed if public health and cross-sectoral initiatives are to be effective in
305 addressing community-scale urban design and land use regulations, policies, and
306 practices. These barriers may include (1) changing how cities are built given that the
307 urban landscape changes relatively slowly, (2) zoning regulations that preclude mixed-
308 use neighborhoods, (3) cost of remodeling/retrofitting existing communities, (4) lack of
309 effective communication between different professional groups (i.e., urban planners,
310 architects, engineers, public health professionals, etc.), and (5) changing behavioral
311 norms directed towards urban design, lifestyle, and physical activity patterns.⁶¹

312 ***Street-scale urban design and land use policies to increase physical activity:*** These
313 interventions use policy instruments and practices to support physical activity in small
314 geographic areas, generally limited to a few blocks. These policies and practices include
315 things such as improved street lighting or infrastructure projects that increase the ease
316 and safety of street crossing, ensure sidewalk continuity, introduce or enhance traffic
317 calming such as center islands or raised crosswalks, or enhance the aesthetics of the street
318 area, such as landscaping.^{61,62} These interventions were designed to enhance the urban
319 environment and/or to increase physical activity by redesigning streets and sidewalks,
320 creating bike lanes/ways, and improving the perceived environment.^{61,62} Most of the
321 interventions reviewed involved issues related to access, aesthetics, and safety.^{61,62}
322 Improved street lighting and traffic calming measures are specific examples of the types

323 of intervention strategies in this group of studies.⁶¹ The studies reviewed were
324 representative from across multiple countries and included one study each from the
325 United States, Australia, Belgium, Canada, England, and Germany.⁶¹ Intervention
326 strategies within this group of studies were relighting streets, redesigning streets, and
327 improving street aesthetics.⁶¹ This type of intervention is likely to be applicable across
328 diverse settings and population groups, provided appropriate attention is paid to adapting
329 the intervention to the specific setting and target population.^{4, 54}

330 ***Transportation and travel policies and practices that promote physical activity:***

331 Transportation/travel interventions of interest to promoting physical activity include
332 interventions that strive to improve pedestrian, transit and light rail access, increase
333 pedestrian and cyclist activity and safety, reduce car use, and improve air quality. An
334 initial review⁶¹ published in 2006 primarily identified intervention strategies to increase
335 walking and bicycling transport. These strategies used policy and environmental changes
336 such as creating and/or enhancing bike lanes, requiring sidewalks, subsidizing transit
337 passes, providing incentives to car or van pool, increasing the cost of parking, and adding
338 bicycle racks on buses.⁶¹ This review identified three studies out of over 90 identified
339 studies from the years 1990-1998 evaluating the effectiveness of transportation and travel
340 policies and practices. Since this review, there has been a major increase in the number
341 of studies examining active transport. In a recent review examining the role of policies to
342 increase and promote active travel, de Nezele, et al.,⁶³ reviewed the available literature
343 associated with the health impact from policies that encourage active travel. The purpose
344 of their study was to identify active transport measures in the context of developing
345 health impact assessment (HIA) models to help decision-makers in developing effective

346 policies in support of healthy environments. This review identified significant modal
347 shifts in active travel across a number of international studies that were in direct response
348 to specific transport policies and interventions.⁶³ The authors concluded that well-
349 designed policies: 1) may enhance health benefits through indirect outcomes such as
350 improved social capital and diet, but these synergies are not sufficiently well understood
351 to allow quantification at this time; and 2) evaluating the impact of active transport
352 policies is highly complex, however, many associations can still be quantified.⁶³

353 ***Community-wide policies and programs:*** Another intervention strategy identified takes
354 place within selected cities in Latin America, including Curitiba and Sao Paulo in
355 Brazil,^{64, 65} Bogota in Colombia,⁴³, Guadalajara in Mexico, Montevideo in Uruguay, and
356 a similar national program in Chile.²⁶ This intervention strategy is characterized by the
357 use of community-wide policies and planning combined with multi-component efforts at
358 the community level to promote physical activity.²⁶ These community action plans and
359 policies are designed to reduce environmental and structural barriers that directly impact
360 physical activity behaviors.²⁶ Plans and policies are promoted through media campaigns
361 and incentives at various levels (e.g., individual, corporate, local, and regional). This type
362 of intervention strategy not only provides information which is intended to motivate
363 individual behavior change, but also focuses on providing institutional and environmental
364 (i.e., structural, social, cultural) support to sustain physical activity behavior change over
365 time.²⁶ An exemplary intervention classified within this category are the programs known
366 as Ciclovias,⁶⁶ which have been rapidly disseminating throughout the region of the
367 Americas. There are Ciclovias in nearly 50% (17 out of 35) of the countries in the
368 Americas.

369 **PROMOTING PHYSICAL ACTIVITY IN COMMUNITIES: TRANSLATION,**
370 **ADAPTATION, AND CAPACITY BUILDING**

371 Based on the existing evidence, an interesting pattern seems to be emerging which
372 highlights important regional differences in the way that the promotion of physical
373 activity is approached. It is possible that community and individual oriented interventions
374 are culturally determined for some populations and settings. In addition, it is
375 acknowledged that evidence-based interventions can be found across all intervention
376 domains, vary in terms of community penetration and reach, and are carried out in
377 multiple settings. This is especially true among the high-middle and high income
378 countries. Despite this variability, there appears to be a substantial evidence base for
379 action to increase physical activity at the population level. It is important to clarify that
380 these are hypotheses that will need further testing and study. For instance, the reviews
381 conducted with literature from Latin America and in particular the review by Hoehner et
382 al.,²⁶ have identified a higher prevalence of community-based and community-directed
383 interventions while the reviews from the U.S. and Europe tend to find more interventions
384 geared towards individual-level interventions.^{2,17,20, 21,24} Strategies such as Ciclovía or
385 physical activity classes in community settings are good examples of these types of
386 community-based interventions that have a large component of social and public
387 interaction. This difference in approach to physical activity interventions comparing the
388 U.S. and Europe with Latin America may be explained in part by the way national
389 governments have addressed public health issues, that is, from the more paternalistic
390 view in Latin America and slightly greater libertarian view in other economically-
391 developed regions of the world. However, interventions like the Ciclovías and the

392 physical activity classes in community settings as seen in Latin America are rapidly being
393 disseminated in cities within North America and Europe. These interventions may be
394 particularly relevant among Hispanic populations within these countries, who may be
395 more responsive to these types of physical activity interventions.

396 The point raised above highlights the importance of local and cultural contexts as well as
397 type of government, cultural dress, and traditions when considering the promotion of
398 physical activity in communities. A specific example of this comes from India where in
399 certain regions and among select tribes of the country, leisure time physical activity in the
400 form of dancing is engrained within the culture.⁶⁷ The same can be said about Brazil
401 where there is a general cultural value for such fitness activities as dancing and
402 soccer.⁶⁵ Documentation and ideally systematic evaluations of established practices and
403 initiatives from large, culturally-diverse developing countries, including other parts of
404 Asia and Africa could be highly informative. Specifically Pratt et al.¹⁹ in this series
405 highlights the mismatch between population density in low and middle income countries
406 and available evidence and presence of physical activity interventions.¹⁹

407 *Role of training and professional development across regions:* An adequately trained
408 public health workforce is a core component of an effective global strategy for a range of
409 public health issues, including the promotion of physical activity.⁶⁸ Part of the solution to
410 this problem is wider dissemination of proven training programs to increase capacity
411 (knowledge and skills) of public health practitioners. Training related to PA interventions
412 can cover a range of topics, from identifying interventions already known effective, to
413 adapting interventions from one population to another, to evaluating interventions as they
414 are being implemented. Perhaps the best-established training program for building

415 capacity in PA intervention is the Physical Activity and Public Health [PAPH]
416 Practitioner’s Course on Community Interventions, sponsored by the University of South
417 Carolina Prevention Research Center.^{69, 70} This is a six-day intensive course that has been
418 offered annually since 1996 and has trained over 360 Fellows. Its goal is to provide
419 practitioners with a framework for evidence-based practice.⁷¹

420 Through the former U.S. Centers for Disease Control and Prevention’s (CDC) WHO
421 Collaborating Center for Physical Activity and Health Promotion the PAPH course has
422 been replicated in numerous countries including Argentina, Australia, Brazil, Chile,
423 Colombia, Costa Rica, El Salvador, Guatemala, India, Kuwait, Malaysia Mexico, Peru,
424 South Africa, Thailand, and Venezuela. This is a two to seven day intensive course that
425 has been offered since July 2004 and has trained 1,522 Fellows from low to middle
426 income countries and thus increasing the capacity of practitioners and researchers from
427 these countries to develop adapt, and implement evidence-based PA interventions within
428 their countries (see Figure 2). The framework from the PAPH course has also been
429 applied across European countries.⁷² In addition; many universities throughout the world
430 have taken the initiative to offer specific training in physical activity and public health in
431 partnership with national, regional, and local health agencies.^{73, 74, 75} The CDC has
432 worked with the Brazilian Ministry of Health to deliver a version of the course, which
433 focuses on evaluation of community interventions, to more than 500 health care
434 professionals in Brazil. Up to 2012, more than 1800 health professionals from over 60
435 countries have been trained in these courses by a multi-national faculty; this model has
436 influenced other public health training programs.⁷⁵ The Agita São Paulo Program,
437 through the Centre for Laboratory Studies on Physical Fitness of São Caetano do Sul

438 [CELAFISCS]), Brazil has been spearheading physical activity related empowerment at
439 various levels and among multiple stakeholders across Latin America for more than a
440 decade.⁷⁶ Exemplary PAPH networks have emerged that are working together to support
441 capacity building in the region of the Americas and have a strong policy and practice
442 focus, including Agita Mundo, RAFA/PANA (Physical Activity Network of the
443 Americas), and country specific networks for physical activity promotion such as the
444 networks of Brazil and Colombia (Recolaf).^{75, 76, 77}

445 *Implementing physical activity interventions in communities, keys to success:*

446 Influencing population-wide levels of physical activity has proven to be a complex
447 process, one that is driven by factors associated with intra-individual, socio-cultural,
448 environmental, political, and financial determinants.⁷⁸ In reviewing the current physical
449 activity intervention literature a number of significant themes emerge from examples
450 across the globe. Regardless of income status from country to country the following
451 components of promising and successful physical activity intervention implementation
452 are evident when communities:

- 453 1. Set aside sufficient resources to effectively inform, educate, and empower their
454 residents to achieve recommended levels of physical activity where they live,
455 work, and learn.
- 456 2. Mobilize inter-sectoral partnerships to develop effective strategies through
457 informational, social and behavioral, and policy and environmental approaches to
458 promoting physical activity.
- 459 3. Develop policies and plans for policy implementation and evaluation that support
460 individual and community efforts to promote physical activity and active living.

- 461 4. Use evidence-based and promising practice methods for planning and
462 implementing community-based physical activity interventions and
463 communicating physical activity messages.
- 464 5. Implement innovative new interventions and ensure these are evaluated to add to
465 the evidence base.
- 466 6. Understand and promote active living principles through national, regional/state,
467 and community partnerships to organize and support active transport, active sport,
468 and active recreation.
- 469 7. Understand and apply the key components of an evidence-based approach to
470 physical activity promotion evaluation.
- 471 8. Partner with public health agencies to conduct routine surveillance of physical
472 activity and inactivity behaviors among community-specific residents, including
473 selected health, environmental, and policy correlates.
- 474 9. Provide training and capacity building in partnership with other community
475 organizations in the use and adaptation of evidence-based physical activity
476 interventions.

477

478 **PROMOTING PHYSICAL ACTIVITY IN COMMUNITIES: LIMITATIONS**
479 **AND NEXT STEPS**

480 A number of limitations are associated with the present ‘review of reviews’. Although an
481 attempt was made to canvas the global literature irrespective of language, the current
482 review draws primarily from the published literature representing the languages of
483 English, Spanish, and Portuguese. In addition, there was no attempt to complete a

484 thorough search of the ‘gray’ literature, and a significant portion of the published
485 literature reviewed lacked measures of external validity and hence limited the
486 generalizability of the findings to other settings and countries. Despite these limitations,
487 the systematic organization of these findings should be valuable to practitioners as well
488 as physical activity and health scientists.

489

490 As the above review and international perspective on physical activity intervention
491 shows, there are a significant number of evidence-based approaches that demonstrate an
492 acceptable level of effectiveness in increasing physical activity across different ages,
493 social groups, and countries. Similarly there are several promising and emerging
494 interventions from middle income countries that deserve attention and more rigorous
495 evaluation, as they can potentially be cost effective and replicable in other settings. In
496 this international evidence-based perspective, while there is a place for informing and
497 motivating individuals to adopt physical activity, the more-traditional public-health
498 protection and promotion role in ensuring that environments are safe and supportive of
499 good health and the avoidance of disease has emerged as a major element of the
500 intervention agenda for physical activity.⁷⁹ For children and adolescents, there is
501 enormous potential to increase physical activity through school-focused initiatives. For
502 the whole population, and particularly for adults, there is much to be gained through
503 developing policies and environmental supports (particularly through partnerships with
504 other sectors, specifically transport and urban planning) that increase opportunities for
505 physical activity within communities.⁸⁰ Because disparities exist in physical activity
506 levels among subgroups of the populations, public health professionals need to tailor

507 policy and environmental efforts and programs to promote increased physical activity
508 opportunities across the board, with particular attention to initiatives that address the
509 needs of disadvantaged subgroups.
510

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789 Table 1. Characteristics of Reviewed Studies

<u>Setting/target group</u>	<u>Number of studies</u>	<u>Range of publication years (median publication year)</u>	<u>Number of studies reviewed</u>	<u>Countries of included studies</u>	<u>Type of systematic review</u>	<u>Minorities and low SES population (n)</u>
<u>School settings</u>	5	2009-2011 (2011)	64	USA, France, Norway, Belgium, Germany, Greece, Australia, Russia, England, Canada, Brazil, Iran, Denmark, Sweden, Spain.	Narrative: 4 Review of reviews: 1	Yes (2)
<u>Workplace settings</u>	5	2002-2010 (2005)	191	US, Australia, New Zealand, Finland, Spain, England, Belgium, Norway, Canada.	Narrative: 5	Not specified
<u>Community settings</u>	18	2002-2011 (2008)	330	England, Scotland, Wales, USA, Australia, Switzerland, Finland, Germany, Canada, Belgium, Brazil, Netherlands, Russia, China, Denmark, Chile, Colombia, Cyprus, Philippines, Iran, Pakistan, Norway.	Narrative: 17 Review of reviews: 1	Yes (8)
<u>Clinical settings/primary care</u>	19	2000-2010 (2005)	234	USA, Australia, New Zealand, England, Canada, Sweden, Finland, South Korea, Spain, Austria, China, Croatia, Italy, France, Netherlands, Norway, Japan, Belgium.	Narrative: 17 Meta Analyses: 2	Yes (5)
<u>Multiple settings</u>	40	2001-2011 (2008)	1116	USA, England, Scotland, Wales, Sweden, Australia, Canada, Denmark, Netherlands, Germany, Norway, Finland, Ireland, Switzerland, Greece, France, Spain, South Korea, New Zealand, North Korea,	Narrative: 32 Meta Analyses: 6 Review of reviews: 2	Yes (27)

				Japan, Colombia.		
<u>Not specified</u>	13	2002-2011 (2008)	354	Germany, USA, Netherlands, Switzerland, Scotland, Australia, Canada, Belgium, Greece, Ireland, Finland.	Narrative: 9 Meta Analyses: 3 Review of reviews: 1	Yes (6)
<u>Total</u>	100		2289		Narrative: 84 Meta analyses: 11 Review of reviews: 5	52

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791 Figure 1. World map according to income level distribution by number of physical
792 activity and public health courses and/or workshops conducted over the past 10 years

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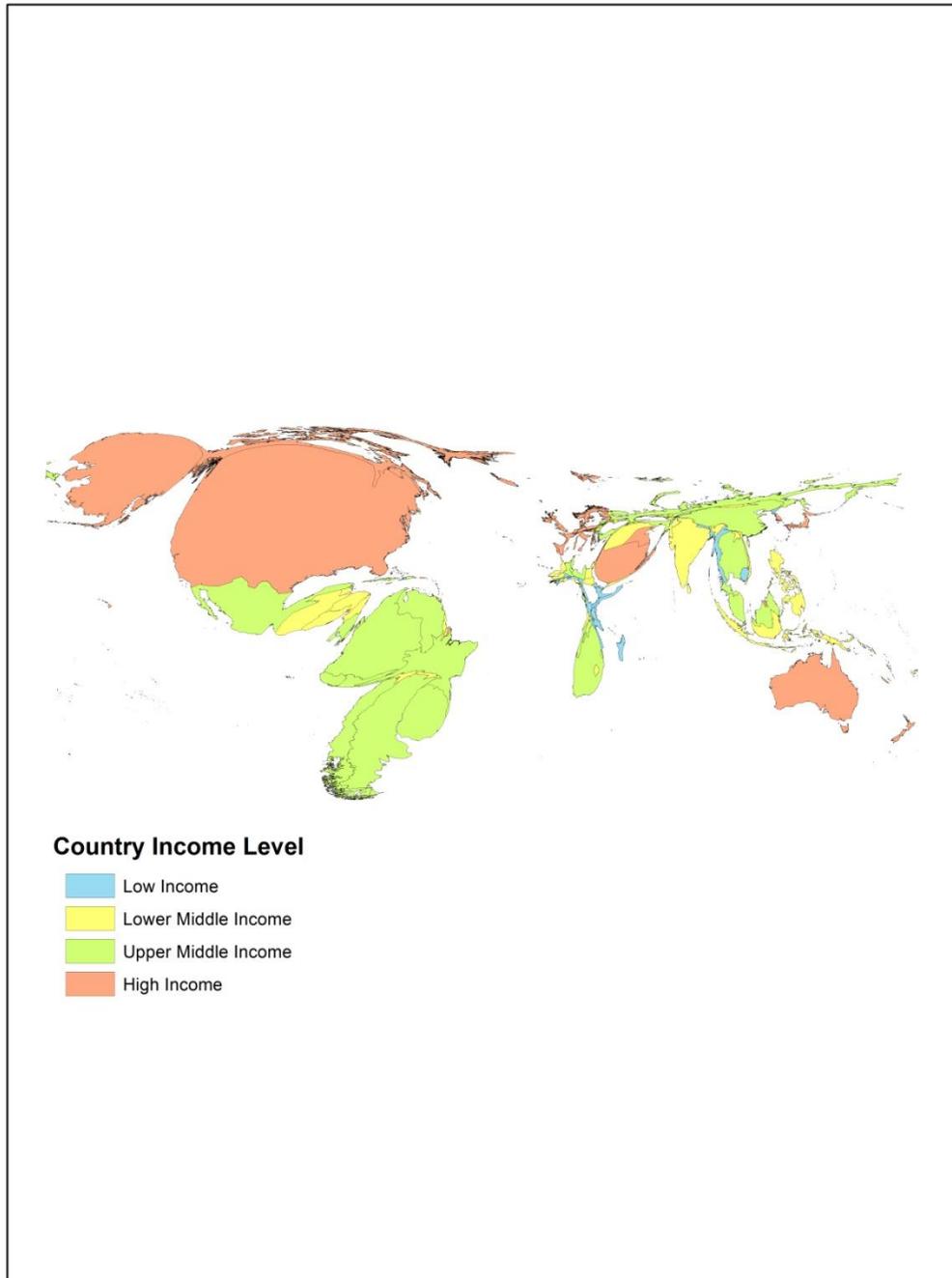
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810 Figure 1.

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Appendices

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814 Panel #1 (Word Count = 426)

815 Systematic review of reviews search methods

816 We conducted a systematic search to identify the latest reviews of the literature regarding
817 interventions to increase physical activity in order to provide input for a simulation model
818 of physical activity interventions and megatrends (table 1). We used the following
819 electronic databases, websites, and published sources for our search: Clinical Evidence,
820 Cochrane Library, Centre for reviews and dissemination (DARE admin database, HTA,
821 NCCHTA), EMBASE, National Guidelines Clearinghouse, MEDLINE, PUBMED,
822 NICE, PsycINFO, SIGLE, Sociological Abstracts, and TRIP. We searched the databases
823 for systematic reviews or meta-analyses related to interventions and physical activity in
824 human subjects, published from January 2001 to July 2011 and PUBMED from January
825 2000 to July 2011 (see Pratt et al paper of this series appendix). Reviews were classified
826 according to setting and type of intervention (clinical, community, schools, workplace, or
827 other).

828

829 We analyzed 100 reviews of physical activity interventions (see Pratt et al paper of this
830 series appendix). Five systematic reviews were reviews-of-reviews, 11 were meta-
831 analyses, and 84 were narrative reviews that did not provide quantitative effect estimates
832 results from pooled effects or meta-regressions. Nineteen reviews covered interventions
833 in clinical settings, 18 described community settings, five covered school settings, five
834 described workplace settings, and the remaining reviews included multiple settings or
835 reported not having a setting restriction (table 1). Sixty reviews included studies

836 conducted only in high-income countries, while only eight included studies conducted in
837 LMICs; 32 reviews did not include country specific information. Fifty reviews included
838 studies of adults; 19 of children and adolescents; 11 of adults and children; three of older
839 adults; 13 of any age group; and four did not specify the age group.

840 Five reviews focused only on minorities including Latino women, African
841 American, and low socioeconomic (SES) populations; 43 reported studies that included
842 minority groups such as African American, Hispanic, Native Americans, Asian
843 immigrants, Pacific Islanders immigrants, individuals living in rural areas, and
844 populations from low SES; 52 did not specify whether studies did or did not include
845 minority populations. (See Table 1).

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- 848 • **DARE and HTA** searched September 14 2011 (limited from January 2001 to July 3,
849 2011)
- 850 • **The Cochrane Library** searched September 14 2011 (limited from 2001 to 2011)
- 851 • **Trip** searched September 14 2011 (limited from 2001 to 2011)
- 852 • **SIGLE (OpenGrey)** searched September 14 2011 (limited from 2001 to 2011)
- 853 • **National Guidelines Clearinghouse** searched September 14 2011 (limited from
854 2001 to 2011)
- 855 • **APA** (includes Psycinfo, Psycbooks, Psycarticles) searched September 14 2011
856 (limited from 2001 to 2011)
- 857 • **PUBMED (Medline)** searched until December 20 2011

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859 CASE STUDY #1 (Word Count = 343)

860 **Community-wide promotion of physical activity in Curitiba, Brazil**

861 The initiative *CuritibAtiva* is a comprehensive and multi-component strategy for the
862 promotion of physical activity and sports during leisure time, in the city of Curitiba,
863 located in southeast Brazil. The program is under the coordination of the Municipal
864 secretary of sports and leisure in partnership with the secretary of Health.^{43,81} The
865 program offers a vast array of activities that encourage and promote physical activity
866 free of charge to the population. Some of the activities offered through the physical
867 activity programs in Curitiba are: 1) media dissemination of the benefits of regular
868 physical activity and recommendations for an active lifestyle through various
869 channels (press, radio, television), 2) physical activity classes in community settings
870 delivered by trained instructors, 3) mass street and park events where attendants can
871 have a free fitness assessment and an individualized prescribed exercise plan
872 according to their results, and 4) other community events such as school games,
873 marathons, races, and bicycling events. The combination of all these strategies were
874 classified under the “community-wide policies and planning” category of the GUIA
875 review.²⁶ Community-wide policies and planning have been identified as a promising
876 and emerging strategy for increasing population levels of physical activity.
877 Sustainability of the program has been explained by a combination of policies and
878 factors, including local and national level multi-sectoral collaboration, interaction of
879 community and local government, successions of political administrators and staff
880 with common views, and use of existing public infrastructures (streets, parks,
881 markets, and plazas). A cross-sectional study was conducted in 2008 to begin the

882 evaluation of CuritibaAtiva. Results from this study showed that exposure
883 (awareness, former and current participation) to the program was associated with an
884 increased likelihood of meeting PA recommendations during leisure time.⁶⁴
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886 CASE STUDY #2 (Word Count = 455)
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888 **And environmental intervention in Odense Cycle City, Denmark**

889 In a four year period from 1999 to 2003 the City of Odense, 3rd City of Denmark, made
890 50 different interventions to promote commuter cycling in the City.^{82, 83} Interventions
891 included changes of the environment, traffic rules and campaigns. The total price
892 invested during the four years was \$4M. Environmental changes included a) new bike
893 lanes on main roads, b) bike lanes in 20 right turns were changed, so that cyclists could
894 turn before the actual cross, and so they didn't have to stop traffic lights, c) bike lanes in
895 5 T-crosses were changed, so that cyclists could pass without stopping for a traffic light,
896 d) traffic lights were synchronized, so that cyclists cycling at 22 km/h or more would hit
897 a green light, for this 6 Dobbler radars were installed, which measured the speed of
898 cyclist, e) stop signs were set up for cars giving cyclists priority in crossings, f) lockers
899 for bikes were installed at the central railway station and shelters for 2000 bikes were
900 built around the city. Street lights were installed on bike lanes where needed. Other
901 interventions included city employees cycling around the city taken photographs of bike
902 lanes to identify places where maintenance was needed, in addition, the budget for
903 repairing was increased by the municipality. Similarly, all cyclists could send SMS to the
904 municipality to report poor bike lanes. Installation of 16 electronic trip counters showed
905 how many bikes had passed on a daily, weekly, monthly, and yearly basis. These counts
906 were also used in the validation of the intervention in terms of increased number of trips.
907 Additionally, high pressure bike pumps were placed beside the electronic counters. An
908 internet page was constructed where cyclists could plan the fastest, the shortest or the

909 most appealing route. Five police officers had their local patrol on bike and many
910 postmen used bikes to deliver post.

911 The project was evaluated in 2003 after four years of intervention by the number of trips
912 in the city compared to trends in other major cities in Denmark. Further, hospital records
913 including accidents where cyclists were involved were obtained. During the four years of
914 the intervention the number of cycle trips increased gradually by 20%, while the number
915 of cycle trips decreased slightly in the rest of the country. A 20% decrease was found in
916 the number of accidents involving cyclists. This decrease may partly be caused by safer
917 bike lanes and higher awareness of drivers. Perceived safety was evaluated by
918 questionnaire, both cyclists and drivers reported feeling safer than before the
919 intervention. The mean cycle commuter speed increased by 2% and the commuter
920 cyclists experienced 15% fewer stops.

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945 CASE STUDY #3 (Word Count = 470)

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947 **Kinder-Sportstudie (KISS) School-based Intervention - Switzerland**

948 The Kinder-Sportstudie (KISS) is a randomized school-based physical activity program

949 including 1st and 5th grade children.⁸⁴ The intervention was targeted at both the cluster

950 and the individual level with the aim of increasing daily physical activity. Children in

951 both groups had three physical education (PE) lessons each week. The intervention group

952 had two additional physical education lessons on the remaining school days. A team of

953 expert PE teachers prepared all five PE lessons for the children in the intervention group.

954 The three compulsory 45 min weekly PE lessons were given by the usual classroom

955 teachers according to the specified curriculum, whereas the two additional weekly 45 min

956 lessons were taught mostly outdoors by PE teachers. In addition, three to five short

957 activity breaks (two to five minutes each) during academic lessons—comprising motor

958 skill tasks such as jumping or balancing on one leg, power games, or coordinative tasks—

959 were introduced every day. Further, children received daily physical activity homework

960 of about 10 minutes' duration. This included aerobic, strength, or motor skill tasks.

961 Children and parents in the control group were not informed about the existence of the

962 intervention program in other schools. The teachers in the control group knew about the

963 intervention arm but were not informed about its content. No incentives for participating

964 in the study were offered to the children. Mean age was 6.9 (SD 0.3) years for first

965 grade, and 11.1 (0.5) years for fifth grade children. After adjustment for grade, sex,

966 baseline values, and clustering within classes, children in the intervention arm compared

967 with controls showed more negative changes in the z score of the sum of four skinfolds

968 (−0.12, 95% confidence interval −0.21 to −0.03; P=0.009). Likewise, their z scores for

969 aerobic fitness increased more favorably (0.17, 0.01 to 0.32; P=0.04), as did those for
970 moderate-vigorous physical activity in school (1.19, 0.78 to 1.60; P<0.001), all day
971 moderate-vigorous physical activity (0.44, 0.05 to 0.82; P=0.03), and total physical
972 activity in school (0.92, 0.35 to 1.50; P=0.003). Z scores for overall daily physical
973 activity (0.21, -0.21 to 0.63) and physical quality of life (0.42, -1.23 to 2.06) as well as
974 psychological quality of life (0.59, -0.85 to 2.03) did not change significantly. HDL,
975 fasting glucose, triglyceride and blood pressure were analyzed as secondary outcomes.
976 HDL, glucose and triglyceride improved significantly while no change was found in
977 blood pressure. This school based multi-component physical activity intervention
978 including compulsory elements improved physical activity and fitness and reduced
979 adiposity in children. It seemed that it is important that PE teachers carry out the
980 intervention and the total physical activity level is quite high, and close to one hour of
981 activity per day. The effect size of the whole population may be less important than the
982 change among the sedentary children, because these are the children where health
983 improvement is most needed.

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994 CASE STUDY #4 (Word Count = 433)

995 **Effects of “10,000 Steps Ghent”: A Whole-Community Intervention**

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997 Background: Currently there is a great deal of interest in multi-component community-

998 based approaches directed towards changing physical activity or health behaviors. The

999 opportunity to objectively assess the impact of multiple and synergistic intervention

1000 strategies, including policy, environmental, social, and behavioral approaches was

1001 provided with the initiation of The “10,000 Steps Ghent” project. Methods: A multi-

1002 component community-based intervention was implemented in 2005 with follow-up

1003 measurements in 2006 to promote physical activity among adults living in the city of

1004 Ghent, Belgium.⁸⁵ The intervention components included the following: A local media

1005 campaign where press conferences were organized at the beginning of the project and six

1006 other times throughout the intervention, along with newspaper coverage, mailed

1007 periodicals, newscasts, and billboards; a website was created to provide information

1008 about the project along with physical activity and health messages and tips on physical

1009 activity and commonly asked questions and answers (www.10000stappen.be);

1010 environmental approaches which included street signage identifying walkable distances

1011 and destinations; the sale and loan of pedometers along with a booklet with “how-to”

1012 information and a step-count log available at a variety of retail outlets including sporting

1013 goods stores, pharmacies, health insurance companies, schools, and recreational/sport

1014 centers; workplace physical activity program kits were made available to

1015 health/personnel departments of all companies; programming targeting older adults in

1016 community centers and the local town park; dissemination of information such as flyers,
1017 posters, and information about the pedometer sale/loan to schools, health care providers,
1018 associations, and societies. In 2005, 872 randomly selected subjects (aged 25 to 75),
1019 from the intervention community, Ghent and 810 subjects from a comparison
1020 community, participated in the baseline measurements. Of these, 660 intervention
1021 subjects and 634 comparison subjects completed the follow-up measurements in 2006.
1022 Results: After one year of intervention there was an increase of 8% in the number of
1023 people reaching the “10,000 steps” standard in Ghent, compared with no increase in the
1024 comparison community. Average daily steps increased by 896 (95% CI_599–1192) in the
1025 intervention community, but there was no increase in the comparison community (mean
1026 change _135 [95% CI_ 432 to 162]) (F time _ community_22.8, p _0.001). Results are
1027 supported by self-reported measures of physical activity as assessed by the International
1028 Physical Activity Questionnaire (IPAQ). Conclusions: The “10,000 steps/day” message
1029 successfully reached the Ghent population as evidenced by an increase in pedometer-
1030 determined physical activity levels following 1 year of multi-component interventions.
1031 These results support the practice of combining policy and environmental approaches to
1032 promoting physical activity, along with informational and social/behavioral approaches to
1033 ensure overall success of a community-based effort to promote physical activity.
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**PHYSICAL ACTIVITY 3
WEB APPENDICES**

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Table of Contents

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Section 1: Search Methods and Summary Table (separate Excel File)..... 3
Section 2: Effective Physical Activity Intervention Case Studies..... 4-5

31 **Systematic review of reviews search methods:**

32 We conducted a systematic search to identify the latest reviews of the literature regarding interventions to
33 increase physical activity (See Web Spreadsheet). We used the following electronic databases, websites,
34 and published sources for our search: Clinical Evidence, Cochrane Library, Centre for reviews and
35 dissemination (DARE admin database, HTA, NCCHTA), EMBASE, National Guidelines Clearinghouse,
36 MEDLINE, PUBMED, NICE, PsycINFO, SIGLE, Sociological Abstracts, and TRIP. We searched the
37 databases for systematic reviews or meta-analyses related to interventions and physical activity in human
38 subjects, published from January 2001 to July 2011 and PUBMED from January 2000 to July 2011 (see
39 Pratt et al paper of this series appendix). Reviews were classified according to setting and type of
40 intervention (clinical, community, schools, workplace, or other).

41 We analyzed 100 reviews of physical activity interventions (see Pratt et al.,²³ - appendix). Five systematic
42 reviews were reviews-of-reviews, 11 were meta-analyses, and 84 were narrative reviews that did not
43 provide quantitative effect estimates results from pooled effects or meta-regressions. Nineteen reviews
44 covered interventions in clinical settings, 18 described community settings, five covered school settings,
45 five described workplace settings, and the remaining reviews included multiple settings or reported not
46 having a setting restriction (table 1). Sixty reviews included studies conducted only in high-income
47 countries, while only eight included studies conducted in low and middle income countries; 32 reviews did
48 not include country specific information. Fifty reviews included studies of adults; 19 of children and
49 adolescents; 11 of adults and children; three of older adults; 13 of any age group; and four did not specify
50 the age group.

51 Five reviews focused only on minorities including Latino women, African American, and low
52 socioeconomic (SES) populations; 43 reported studies that included minority groups such as African
53 American, Hispanic, Native Americans, Asian immigrants, Pacific Islanders immigrants, individuals living
54 in rural areas, and populations from low SES; 52 did not specify whether studies did or did not include
55 minority populations.

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62 2011)
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86 **Effective Physical Activity Intervention Case Studies:**

87 Case Study #1: An environmental intervention in Odense Cycle City, Denmark.

88 In a four-year period (1999 – 2003) the City of Odense, Denmark, made 50 different interventions to
89 promote commuter cycling.^{1,2} Interventions included changes of the environment, traffic rules and
90 campaigns. The total price invested during the four years was \$4M. Environmental changes included a)
91 new bike lanes on main roads, b) bike lanes in 20 right turns were changed so that cyclists could turn before
92 the actual cross, and so they did not have to stop at traffic lights, c) bike lanes in 5 T-crosses were changed
93 so that cyclists could pass without stopping for a traffic light, d) traffic lights were synchronized, so that
94 cyclists cycling at 22 km/h or more would hit a green light. For this 6 Dobbler radars were installed, which
95 measured the speed of cyclists, e) stop signs were set up for cars giving cyclists priority in crossings, f)
96 lockers for bikes were installed at the central railway station and shelters for 2000 bikes were built around
97 the city. In addition, street lights were installed on bike lanes where needed. Other interventions included
98 city employees cycling around the city taken photographs of bike lanes to identify places where
99 maintenance was necessary coupled with an increase in the municipality budget for maintenance of the
100 lanes. Cyclists could send SMS to the municipality to report poor bike lanes. Installation of 16 electronic
101 trip counters showed how many bikes had passed on a daily, weekly, monthly, and yearly basis. These
102 counts were also used in the validation of the intervention in terms of increased number of trips.
103 Additionally, high pressure bike pumps were placed beside the electronic counters. An internet page was
104 constructed where cyclists could plan the fastest, the shortest or the most appealing route. The project was
105 evaluated in 2003 after four years of intervention by comparing the number of trips in the city with trends
106 in other major cities in Denmark. Further, hospital records including accidents that involved cyclists were
107 obtained. During the four years of the intervention the number of cycle trips increased gradually by 20%,
108 while the number of cycle trips decreased slightly in the rest of the country. A 20% decrease was found in
109 the number of accidents involving cyclists. This decrease may partly be due to safer bike lanes and higher
110 awareness of drivers. Perceived safety was evaluated via questionnaire; both cyclists and drivers reported
111 feeling safer than before the intervention. The mean cycle commuter speed increased by 2% and the
112 commuter cyclists experienced 15% fewer stops.

113
114 Case Study #2: Kinder-Sportstudie (KISS) School-based Intervention – Switzerland.

115 The Kinder-Sportstudie (KISS) is a randomized school-based physical activity program among 1st and 5th
116 grade children.³ The intervention was targeted at both the cluster and the individual level with the aim of
117 increasing daily physical activity. Children in both groups had three physical education (PE) lessons each
118 week. The intervention group had two additional physical education lessons on the remaining school days.
119 A team of expert PE teachers prepared all five PE lessons for the children in the intervention group. The
120 three compulsory 45 minutes of weekly PE lessons were delivered by regular classroom teachers according
121 to the specified curriculum, whereas the two additional weekly 45 min lessons were taught by PE teachers
122 mostly outdoors. In addition, three to five short activity breaks (two to five minutes each) during academic
123 lessons—comprising motor skill tasks such as jumping or balancing on one leg, power games, or
124 coordinative tasks—were introduced every day. Further, children received daily physical activity
125 homework of about 10 minutes' duration. This included aerobic, strength, or motor skill tasks. Children and
126 parents in the control group were not informed about the existence of the intervention program in other
127 schools. The teachers in the control group knew about the intervention arm but were not informed about its
128 content. No incentives for participating in the study were offered to the children. Mean age was 6.9 (SD
129 0.3) years for first grade, and 11.1 (0.5) years for fifth grade children. After adjustment for grade, sex,
130 baseline values, and clustering within classes, children in the intervention arm compared with controls
131 showed significant reductions in measures of fatness determined through skinfolds increased aerobic
132 fitness, increased moderate-vigorous physical activity in school, all day moderate-vigorous physical
133 activity, total physical activity in school and overall. In addition, other biological risk factors for the
134 development of chronic disease such as HDL, glucose and triglycerides, improved significantly. This
135 school based multi-component physical activity intervention including compulsory elements improved
136 physical activity and fitness and reduced adiposity in children.

137
138 Case Study #3: Effects of “10,000 Steps Ghent”: A Whole-Community Intervention. Currently there is a
139 great deal of interest in multi-component community-based approaches directed towards changing physical
140 activity or health behaviors. The opportunity to objectively assess the impact of multiple and synergistic
141 intervention strategies, including policy, environmental, social, and behavioral approaches was provided

142 with the initiation of the “10,000 Steps Ghent” project. A multi-component community-based intervention
143 was implemented in 2005 with follow-up measurements in 2006 to promote physical activity among adults
144 living in the city of Ghent, Belgium.⁴ The intervention components included the following: A local media
145 campaign where press conferences were organized at the beginning of the project and six other times
146 throughout the intervention, along with newspaper coverage, mailed periodicals, newscasts, and billboards;
147 a website was created to provide information about the project along with physical activity and health
148 messages and tips on physical activity and commonly asked questions and answers; environmental
149 approaches which included street signage identifying walkable distances and destinations; the sale and loan
150 of pedometers along with a booklet with “how-to” information and a step-count log available at a variety of
151 retail outlets including sporting goods stores, pharmacies, health insurance companies, schools, and
152 recreational/sport centers; workplace physical activity program kits were made available to
153 health/personnel departments of all companies; programming targeting older adults in community centers
154 and the local town park; dissemination of information such as flyers, posters, and information about the
155 pedometer sale/loan to schools, health care providers, associations, and societies. In 2005, 872 randomly
156 selected subjects (aged 25 to 75), from the intervention community (Ghent) and 810 subjects from a
157 comparison community, participated in the baseline measurements. Of these, 660 intervention subjects and
158 634 comparison subjects completed the follow-up measurements in 2006. After one year of intervention
159 there was an increase of 8% in the number of people reaching the “10,000 steps” standard in Ghent,
160 compared with no increase in the comparison community. Average daily steps increased by 896 in the
161 intervention community versus no increase in the comparison community. Results are supported by self-
162 reported measures of physical activity as assessed by the International Physical Activity Questionnaire
163 (IPAQ). The “10,000 steps/day” message successfully reached the Ghent population as evidenced by an
164 increase in pedometer-determined physical activity levels following 1 year of multi-component
165 interventions. These results support the practice of combining policy and environmental approaches to
166 promoting physical activity, along with informational and social/behavioral approaches to ensure overall
167 success of a community-based effort to promote physical activity.
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177 2002]. Ugeskr Laeger. 2005; 167: 1164-1166.
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182 a whole-community intervention. Am J Prev Med. 2007; 33(6):455–463.
183 (www.10000stappen.be).
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Reference	Year of publication	Year of the systematic search	Language for the systematic search	Objective	Age group	Setting	Type of studies reviewed	Countries/region of studies	Effect size estimates	Type of systematic review
Eakin EG et al. Review of primary care-based physical activity intervention studies: effectiveness and implications for practice and future research. Journal of Family Practice. J Fam Pract. 2000;49(2):158-68.	2000	1980 to 1998	English	To summarize the literature on primary care-based interventions for increasing physical activity and make recommendations for future research and for integrating successful strategies into practice.	Adults (\geq 18 years)	Health care	RCT and QE	NS	Intervention 0-11 months: SMD range= 0.003-0.26; OR range= 1.04-3.73. Intervention \geq 12 months SMD ES= 0.09; OR range= 0.09-1.39	Narrative review
Marshall SJ. The transtheoretical model of behavior change: a meta-analysis of applications to physical activity and exercise. Annals of Behavioral Medicine. 2001; 23(4) 229-246.	2001	1983 to 2000	English	To summarize the findings from empirical applications of TTM in the physical activity domain.	Adults (<25 to +55 years)	Community, health care, worksite, education	Cross-sectional cohort study, RCT and QE	USA, Canada, UK, Australia	ES= SMD for preparation to action=0.85; SMD for precontemplation to contemplation=0.34	Meta-analysis
Lawlor DA. The effect of physical activity advice given in routine primary care consultations: a systematic review. J Public Health Med. 2001;23(3):219-26.	2001	1966 to 2000	NR	To determine the effect of advice given in routine primary care consultations on levels of physical activity.	Adults (\geq 18 years)	Health care	RCT and QE	USA, Australia	NAES	Narrative review
Dunn C. The use of brief interventions adapted from motivational interviewing across behavioral domains: a systematic review. Addiction. 2001; 96(12):1725-42.	2001	1983 to 1999	English	To examine the effectiveness of brief behavioral interventions adapting the principles and techniques of Motivational Interviewing to four behavioral domains: substance abuse, smoking, HIV risk and	NS	Health care	RCT	NS	ES range SMD=0.00 95% CI (-0.29, 0.29)-0.42 95% CI (-0.09, 0.93)	Narrative review

				diet/exercise.						
Fogelholm M. Community health-promotion interventions with physical activity: does this approach prevent obesity? Scandinavian Journal of Nutrition. 2002;46(4): 173–177.	2002	Since 1990	English	To summarize results of community interventions for prevention of cardiovascular diseases, with dietary changes and increased physical activity as target behaviours, and change in obesity as one outcome variable.	NS	Community	Cross-sectional, cohort, QE	USA, Germany, England, Wales	NAES	Narrative review
Banks-Wallace JA. Interventions to Promote Physical Activity Among African American Women. Public Health Nursing. 2002;19(5): 321–335.	2002	1984 to 2000	English	To review interventions trials designed to promote increased physical activity among African American women.	Adults	Community, health care, center based, churches, neighborhood recreation centers	RCT, QE, pre-post-test, cohort	USA	NAES	Narrative review
Conn VS. Interventions to Increase Physical Activity Among Aging Adults: A Meta-Analysis. Ann Behav Med 2002;24(3):190–200.	2002	1966 to 1999	English	To integrate primary research findings that test interventions to increase activity among aging adults.	Adults (mean age 60 to 77,2 years)	Community, health care, home-based	RCT, QE, pre-post-test, cohort	NS	ES=SMD=0.26.	Meta-analysis

<p>Kahn EB. The effectiveness of interventions to increase physical activity. A systematic review. Am J Prev Med. 2002;22(4 Suppl):73-107.</p>	<p>2002</p>	<p>1980 to 2000</p>	<p>English</p>	<p>To evaluate the effectiveness of various approaches to increasing physical activity: informational, behavioral and social, and environmental and policy approaches.</p>	<p>Children and adults</p>	<p>Community, health care, schools, college, worksites, churches, community centers, environment</p>	<p>RCT, QE, cohort</p>	<p>USA, England, Scotland, Wales, Sweden, Australia, Denmark, Greece.</p>	<p>Point of decision prompt: Net increase range ES: 5.5%-128.6%. Community-wide campaigns: Net increase range ES: -2.9%-21.4%. School-based of class time in MVPA: Net increase range 3.3%-125.3%. Social support change in frequency of exercise or physical activity: median net :19.6% (IQ range 14.6% to 57.6%). Individually-Adapted Health Behavior Change Programs: time spent in physical activity median net increase 35.4% (IQ range, 16.7% to 83.3%). Environmental and Policy Approaches: leisure-time physical activity: median increase 2.9% (IQ range, 6.0 to 8.5%).</p>	<p>Narrative review</p>
<p>van der Bij AK. Effectiveness of Physical Activity Interventions for Older Adults: A Review. Am J Prev Med. 2002;22(2):120-133.</p>	<p>2002</p>	<p>1985 to 2000</p>	<p>English, Dutch</p>	<p>To evaluate the effectiveness of physical activity interventions among older adults</p>	<p>Older adults (51-88 years).</p>	<p>Community, home based (residential or nursing homes), health care</p>	<p>RCT</p>	<p>USA, Europe</p>	<p>NAES</p>	<p>Narrative review</p>

Smith BJ. Do primary care interventions to promote physical activity work? A systematic review of the literature. Dec 2002, Report N°CPAH 03-0002. The National Institute of Clinical Studies, Melbourne, Australia. NSW Centre for Physical Activity and Health.	2002	Since 1966	English	To determine whether interventions undertaken with patients in primary care settings can be effective in increasing their physical activity participation	Adults (18-65+ years)	Health care	RCT, QE	UK, Sweden, USA, Australia	NA	Narrative review
Eden KB. Does counselling by clinicians improve physical activity? A summary for the U.S. Prevention Services Task Force. Annals of Internal Medicine. 2002;137(3): 208-15.	2002	1994 to 2002.	NR	To determine whether counseling adults in primary care settings improves and maintains physical activity levels.	Adults (18-75+ years)	Health care	RCT, QE, Case control, observational	USA, Australia, New Zealand	NAES	Narrative review
Petrella RJ. Does counseling help patients get active? Systematic review of the literature. Can Fam Physician. 2002;48:72-80.	2002	1972 to 2002	NS	To determine the effect of counseling patients to become more physically active.	Adults (18-75+ years)	Health care	RCT, QE	USA, Australia, New Zealand, UK, Canada.	NAES	Narrative review
Proper KI. Effectiveness of physical activity programs at worksites with respect to work-related outcomes. Scand J Work Environ Health. 2002;28(2):75-84.	2002	1980 to 2000	English, German, Dutch	To systematically review the literature on the effectiveness of physical activity programs at worksites with respect to work-related outcomes.	Adults	Workplace	RCT, QE	NS	NA	Narrative review

Conn VS. Integrative Review of Physical Activity Intervention Research with Aging Adults. J Am Geriatr Soc. 2003;51(8):1159-68.	2003	1960 to 2000	English	To conduct an integrative review on studies that tested interventions to increase general physical activity or aerobic exercise among aging adults.	Older adults (65-90 years)	Community, health care, home-based, senior centers, churches, library	RCT	NS	NA	Narrative review
Adams J. Are activity promotion interventions based on the transtheoretical model effective? A critical review. Br J Sports Med. 2003;37(2):106-114.	2003	1982 to 2011	English	To critically review published reports of transtheoretical model based, activity promotion interventions.	Adults (\geq 16 years)	Community, health care, workplace	RCT, QE, pre-post-test	USA, UK	NAES	Narrative review
Proper KI. The Effectiveness of Worksite Physical Activity Programs on Physical Activity, Physical Fitness, and Health. Clinical Journal of Sport Medicine. 2003;13(2):106-117.	2003	1980 to 2000	English	To critically review the literature with respect to the effectiveness of worksite physical activity programs on physical activity, physical fitness, and health.	Adults	Workplace	RCT, QE	NS	NAES	Narrative review
Foster C. Changing the environment to promote health-enhancing physical activity. Journal of Sports Sciences. 2004; 22(8):755-76.	2004	Up to December 2001	English	To present the results of a systematic review of studies that used environmental interventions to increase health-enhancing physical activity.	Adults (\geq 18 years)	Community, environment	QE, pre-post-test, cross-sectional	UK, USA, Australia, Switzerland, Finland	NAES	Narrative review

Ogilvie D. Promoting walking and cycling as an alternative to using cars: systematic review. BMJ. 2004 Oct 2;329(7469):763.	2004	NS	NR	To assess what interventions are effective in promoting a population shift from using cars towards walking and cycling and to assess the health effects of such interventions.	All (>10 years)	Community, environment	RCT, QE, cohort, cross-sectional	UK (Scotland, England), Denmark, USA, Australia, Netherlands, Germany, Norway, Finland	Percentage share of all trips that were shifted from cars to walking and cycling=5%	Narrative review
Shilts MK. Goal setting as a strategy for dietary and physical activity behavior change: a review of the literature. Am J Health Promot. 2004;19(2):81-93.	2004	1977 to 2003	NR	To estimate effectiveness of goal setting for nutrition and physical activity behavior change and investigate effectiveness of interventions containing goal setting.	All	Community, health care workplace, school	RCT, QE, pre-experimental	Italy, USA, Switzerland	NAES	Narrative review
Jago R. Non-curricular approaches for increasing physical activity in youth: a review. Prev Med. 2004; 39(1):157-63.	2004	1970 to 2002	English	To examine the effectiveness of noncurricular interventions for promoting physical activity in youth.	Children and adolescents (5-18 years)	Community, school, summer camps	RCT, QE	USA, UK, Australia	NAES	Narrative review
Goldstein MG. Multiple behavioral risk factor interventions in primary care. Summary of research evidence. Am J Prev Med. 2004;27(2 Suppl):61-79.	2004	1990 to 2004	NS	To review the evidence of interventions of separate or multiple risk behaviors in primary care.	Adults	Health care	RCT, QE, observational	NS	NA	Narrative review

van Sluijs EM. Stage-based lifestyle interventions in primary care: are they effective?. Am J Prev Med. 2004;26(4):330-43.	2004	Up to July 2002	NR	To systematically review the literature concerning the effect of stages-of-change-based interventions in primary care on smoking, physical activity, and dietary behavior in primary care.	Adults (≥ 18 years)	Health care	RCT, QE	NA	NAES	Narrative review
Foster C. Interventions for promoting physical activity. Cochrane Database Syst Rev. 2005;25;(1):CD003180.	2005	1966 to 2005	NR	To assess the effectiveness of interventions designed to promote physical activity in adults aged 16 years and older, not living in an institution.	Adults (18-95 years)	Community, health care	RCT	NS	ES= SMD= 0.28, 95%CI(0.15-0.41) ; SMD=0.52, 95% CI (0.14-0.90); OR= 1.33 95% CI (1.03-1.72)	Meta-analysis
Matson-Koffman DM. A Site-specific Literature Review of Policy and Environmental Interventions that Promote Physical Activity and Nutrition for Cardiovascular Health: What Works?. Am J Health Promot. 2005;19(3):167-93.	2005	1970 to 2003	NR	To review the literature to determine whether policy and environmental interventions can increase people's physical activity or improve their nutrition.	All	Community, health care, schools, workplace, environment	RCT, QE, pre-post-test, cross-sectional	Ireland, Finland, Canada, USA, Switzerland, UK (Scotland, England)	NAES	Narrative review
Hillsdon M. The effectiveness of public health interventions for increasing physical activity among adults: a review of reviews. Evidence briefing (2nd edition), February 2005. Available at www.hda.nhs.uk/evidence	2005	1996 to 2004	English	To identify all relevant systematic reviews and metaanalyses of exercise promotion that are limited to interventions that target individual-level change and measure changes in physical activity at the level of the individual.	Adults	Community, health care, work place	Systematic reviews of RCT, QE	UK,USA, Australia	NA	Review of reviews

Blue CL. Synthesis of Intervention Research to Modify Physical Activity and Dietary Behaviors. Res Theory Nurs Pract. 2005;19(1):25-61.	2005	1993 to 2003	English	To examine conceptual and methodological issues related to research on physical activity and dietary behaviors.	Adults (≥ 18 years)	Community, health care, workplace	RCT, QE	UK, USA	NA	Narrative review
Ashworth NL. Home versus center based physical activity programs in older adults. Cochrane Database Syst Rev. 2005;(1):CD004017.	2005	1966-2002	NR	To assess the effectiveness of 'home based' versus 'center based' physical activity programs on the health of older adults	Older adults (≥50 years)	Community, home-based, center-based	RCT, QE	USA, Spain, Netherlands	NAES	Narrative review
Morgan O. Approaches to increase physical activity: reviewing the evidence for exercise-referral schemes. Public Health. 2005;119(5):361-70.	2005	1966 to 2002	English	To review current evidence of effectiveness for exercise referral schemes.	Adults (>34 years)	Health care	RCT, QE	USA, UK, New Zealand	NAES	Narrative review
Finlay SJ. Physical activity promotion through the mass media: Inception, production, transmission and consumption. Prev Med. 2005; 40(2):121-30-	2005	1997 to 2002	English	To review mass media interventions to promote physical activity from a media studies perspective.	All	Mass media, community	QE, pre-post-test, experimental, cohort	USA, UK (England), Canada, Australia	NAES	Narrative review

Engbers LH. Worksite health promotion programs with environmental changes. Am J Prev Med. 2005;29(1):61-70.	2005	1985 to 2004	English, German, Dutch	To systematically assess the effectiveness of worksite health promotion program's with environmental modifications, on physical activity, dietary intake, and health risk indicators.	Adults	Workplace	RCT or CT	NS	NAES	Narrative review
Foster C. Interventions that use the environment to encourage physical activity. Evidence review. National Institute for Health and Clinical Excellence, September 2006. September 2006. Available at www.nice.org.uk .	2006	Up to May 2005	English	To undertake a review of primary studies of interventions that use the environment to encourage physical activity.	Adults (≥ 18 years)	Community, environment, military, workplace, policy	QE, pre-post-test, cross-sectional	USA, Australia, Finland, UK, Switzerland	NA	Narrative review
Heath GH. The Effectiveness of Urban Design and Land Use and Transport Policies and Practices to Increase Physical Activity: A Systematic Review. Journal of Physical Activity and Health. 2006;3,Suppl 1,S55-S76.	2006	1987-2003	NS	To increase physical activity through changing social networks, organizational norms and policies, the physical environment, resources and facilities, and laws.	Adults	Community, environment, policy	QE, pre-post-test, cohort, cross-sectional	USA, Canada, Australia, Belgium, UK (England), Germany	Community scale urban design: median ES=161%. Street scale urban design and policies: median ES= 35% (IQ range 16%-36%)	Narrative review

NICE. Four commonly used methods to increase physical activity: brief interventions in primary care, exercise referral schemes, pedometers and community-based exercise programmes for walking and cycling. Public health guidance, PH2 - Issued: March 2006. Available at: www.nice.org.uk/page.aspx?o=PhysicalActivityandEnv .	2006	1990 to 2005	NS	This document constitutes a formal guidance on brief interventions in primary care, pedometers, exercise referral schemes and community-based exercise programmes for walking and cycling to increase physical activity	All	Community, health care	RCT;QE, pre-post-test	NS	NA	Narrative review
Kroeze W. A systematic review of randomized trials on the effectiveness of computer-tailored education on physical activity and dietary behaviors. <i>Ann Behav Med.</i> 2006;31(3):205-23.	2006	1965 to 2004	English	To systematically review the scientific literature on computer-tailored physical activity and nutrition education.	Adults	Community, health care, church	RCT	Netherlands, Belgium, USA, UK, Australia	NAES	Narrative review
Tulloch H. Physical activity counseling in primary care: Who has and who should be counseling? <i>Patient Educ Couns.</i> 2006;64(1-3):6-20.	2006	Since 2000	English	To examine the physical activity counseling literature in primary care in order to identify which intervention provider has been used to date and their relative effectiveness for increasing physical activity.	Adults (≥ 18 years)	Health care	RCT, QE	NS	NAES	Narrative review

Sorensen JB. Exercise on prescription in general practice: A systematic review. Scand J Prim Health Care. 2006;24(2):69-74.	2006	1980 to 2005	English	To address exercise on prescription using a health technology assessment perspective.	All	Health care	RCT, pre-post-test	NS	NAES	Narrative review
Vandelanotte C. Website-delivered physical activity interventions a review of the literature. Am J Prev Med. 2007;33(1):54-64.	2007	Up to July 2006	English	To systematically review the research findings and outcomes of website-delivered physical activity interventions and to identify relationships of intervention attributes with behavioral outcomes.	Adults	Community	RCT, QE, pre-post-test	USA, Australia, Canada, Belgium,	Range SMD=0.13 to 0.67. SMD=0.44.	Narrative review
van den Berg MH. Internet-based physical activity interventions: a systematic review of the literature. J Med Internet Res. 2007;30;9(3):e26.	2007	Up to July 2006	English, Dutch, German	To systematically assess the methodological quality and the effectiveness of interventions designed to promote physical activity by means of the Internet as evaluated by randomized controlled trials.	Adults (≥18 years)	Community	RCT	USA, Canada, Australia, Netherlands	NAES	Narrative review
Eakin EG. Telephone interventions for physical activity and dietary behavior change: a systematic review. Am J Prev Med. 2007;32(5):419-34.	2007	1965 to 2006	English	To systematically review the literature on interventions for physical activity and dietary behavior change in which a telephone was the primary method of intervention delivery, with a focus on both internal and external validity.	Adults	Community, health care	RCT, QE	USA, Australia, New Zealand	ES=SMD=0.50; range SMD=0.24-1.19	Narrative review

Campbell KJ. Strategies which aim to positively impact on weight, physical activity, diet and sedentary behaviours in children from zero to five years. A systematic review of the literature. <i>Obes Rev.</i> 2007;8(4):327-38.	2007	1995 to 2006	English	To assess the effectiveness of interventions designed to prevent obesity, promote healthy eating and/or physical activity and/or to reduce sedentary behaviours in 0–5-year-old children.	Children (0-5 years)	Community, health Care, pre-school, child care, home based	RCT, QE, pre-post-test	USA, Canada, UK, Finland	NAES	Narrative review
Bravata DM. Using Pedometers to Increase physical Activity and Improve Health: A systematic review. <i>JAMA.</i> 2007;298(19):2296-304.	2007	1966 to 2007	English	To evaluate the association of pedometer use with physical activity and health outcomes among outpatient adults.	Adults (mean age= 49 years)	Community, health care, work, church	RCT, observational	NS	Pooled estimate from RCT=2491; 95% CI (1098-3885) steps per day. Pooled estimate from observational studies=2183; 95% CI (1571-2796) steps per day.	Meta-analysis
Norman GJ. A review of eHealth interventions for physical activity and dietary behavior change. <i>Am J Prev Med.</i> 2007;33(4):336-345.	2007	2000 to 2005	English	To review eHealth intervention studies for adults and children that targeted behavior change for physical activity, healthy eating, or both behaviors.	Children and adults	Community, health care, workplace, military, schools	RCT, QE	Australia, USA, Canada, South Korea, Belgium	ES range: r= -0.03-0.43	Narrative review
Ogilvie D. Interventions to promote walking: systematic review. <i>BMJ.</i> 2007;334(7605):1204.	2007	1990 to 2007	NR	To assess the effects of interventions to promote walking in individuals and populations.	Children and adults	Community, health care, workplace, schools	RCT, QE	USA, Australia; UK (Scotland), Brazil, Netherlands, Canada	ES= range -11-146 minutes/week. Most promising studies ES= 30-60 minutes/week	Narrative review

Williams NH. Effectiveness of exercise-referral schemes to promote physical activity in adults: Systematic review. British Journal of General Practice. 2007;57(545):979-86.	2007	Up to March 2007	NR	To assess whether exercise-referral schemes are effective in improving exercise participation in sedentary adults.	Adults (≥ 16 years)	Health care, community, church	RCTs, QE, observational studies, process evaluation, qualitative.	UK, Sweden	Pooled RR= 1.20 (95%CI 1.06 to 1.35).	Meta-analysis
van Sluijs EM. Effectiveness of interventions to promote physical activity in children and adolescents: Systematic review of controlled trials BMJ. 2007;335(7622):703.	2007	Up to 2006	NR	To review the published literature on the effectiveness of interventions to promote physical activity in children and adolescents.	Children and adolescents (≤18 years)	School, community, family	RCT, QE	Greece, USA, Ireland, UK, Finland, Canada, Belgium, Netherlands, Australia,	ES= 2.6-83 minutes per week of physical education related physical activity of overall physical activity.	Narrative review
Salmon J. Promoting physical activity participation among children and adolescents. Epidemiol Rev. 2007;29:144-59.	2007	1985 to 2006	NR	To summarize the evidence of the effectiveness of interventions that report physical activity outcomes in children aged 4–12 years and adolescents aged 13–19 years.	Children (4–12 years) and adolescents (13–19 years)	School, health care, community, family, Internet-based	RCT, QE	USA, Canada, UK, Ireland, Greece, Belgium, Finland, France, Spain, Australia.	NAES	Narrative review
Kang M. Effect of Pedometer-Based Physical Activity Interventions: A Meta-Analysis. Physical Education, Recreation and Dance. 2008; 80(3):648–655.	2008	2000 to 2007	NS	To determine the magnitude and direction of effects in pedometer-based interventions.	Children, adults and older adults	Any	RCT, QE, Pre-post	NS	ES=SMD=0.68 (95% CI = 0.55, 0.81) ; average increase in 2,000 steps in the intervention group.	Meta-analysis
Lee MC. Systematic review of active commuting to school and children's physical activity and weight. J Phys Act Health. 2008;5(6):930-49.	2008	Up to 2007	NR	To evaluate interventions among schoolchildren that promoted the positive effects of active commuting on physical activity and overweight.	Children and adolescents	Community	Cohort, cross-sectional	Germany, Russia, UK (Scotland), USA, Australia, Denmark, China, Canada, Portugal, Netherlands,	ES= mean: 28 minutes of MVPA per day; range: 4.7 to 45 additional minutes of MVPA per day .	Narrative review

								Philippines		
Sharma M. Physical activity interventions in Hispanic American girls and women. <i>Obes Rev.</i> 2008;9(6):560-71.	2008	1994 to 2007	English	To review physical activity interventions done with Hispanic American girls and women.	Girls and Women (>10 years)	Community, Health care, home based, school	RCT, pre-post-test	USA	NAES	Narrative review
Müller-Riemenschneider. Long-term effectiveness of interventions promoting physical activity: A systematic review. <i>Preventive Medicine.</i> 2008; 47(4):354–368	2008	2001 to 2007	English, German	To evaluate the long-term effectiveness of physical activity interventions targeted at healthy adults.	Adults (> 18)	Community, health care, work place	RCT	NS	ES=increase in 975 kcal/wk in the intervention group. ES= increase of 11% in physical fitness in the intervention group compared with control group. ES= OR to meet PA targets were 3.31 (1.99–5.52) and 1.52 (1.07–2.14) compared to no-intervention and minimal-intervention control, respectively.	Meta-analysis

Hoehner CM. Physical activity interventions in Latin America: a systematic review. Am J Prev Med. 2008 ;34(3):224-233.	2008	1980 to 2006	English, Portuguese, Spanish.	To assess the current evidence base concerning interventions to increase physical activity in Latin America.	Children and adults	Community, schools, university, worksite, environment , policy	RCT, pre-post test, cross-sectional	Brazil, Chile, Colombia, USA	ES=percentage net change: -50% to 307%	Narrative review
NICE. Promoting and creating built or natural environments that encourage and support physical activity. Public health guidance, PH8 - Issued: January 2008	2008	1990 to 2006	English	To provide information for the formal guidance on promoting and creating built or natural environments that encourage and support physical activity.	All	Environment, community	RCT, QE, pre-post, observational	NS	NA	Narrative review
Breckon JD. Physical Activity Counseling Content and Competency: A Systematic Review. J Phys Act Health. 2008;5(3):398-417.	2008	1995 to 2006	English	To examine the theory on which the intervention is based and the level of treatment fidelity applied at all stages of the intervention.	Adults (≥ 16 years)	Health care	RCT, QE	UK, USA	NAES	Narrative review
Robertson LR. What works with men? A systematic review of health promoting interventions targeting men. BMC Health Serv Res. 2008;8:141.	2008	1990 to 2006	English	To appraise the available evidence of effective interventions aimed at improving men's health.	Adults (≥ 18 years)	Health care	RCT, QE, pre-post-test	USA, Australia, New Zealand	NAES	Narrative review

Flemming P. Lifestyle interventions in primary care: Systematic review of randomized controlled trials. Can Fam Physician. 2008;54(12):1706-13.	2008	1985 to 2007	English	To determine whether lifestyle counseling interventions delivered in primary care settings by primary care providers to their low-risk adult patients are effective in changing factors related to cardiovascular risk.	Adults (18 to 79 years)	Health care	RCT	UK (England), New Zealand, Finland, Australia	NAES	Narrative review
Carroll JK. Getting patients to exercise more: A systematic review of underserved populations. J Fam Pract. 2008;57(3):170-6, E1-3, 1 p following E3.	2008	1966 to 2005	English	To assess clinical trials of clinician initiated counseling interventions for promoting physical activity in underserved populations.	Children and adults	Health care	RCT, QE	USA	NAES	Narrative review
Priest N. Interventions implemented through sporting organisations for increasing participation in sport. Cochrane Database Syst Rev. 2008; (3):CD004812.	2008	Updated the original 2004 systematic search 2007	NR	To determine the effects of interventions implemented through sporting organisations to increase (active and nonactive) participation in organised sport.	All	Multiple	RCT, QE, pre-post-test	NS	NA	Narrative review
Williams DM. Interventions to Increase Walking Behavior. Med Sci Sports Exerc. 2008;40(7 Suppl): S567-S573.	2008	Since 1980	NS	To review studies of walking promotion interventions.	Adults (\geq 18)	Workplace, health care, community	RCT	USA, Australia, UK	NAES	Narrative review

Jenkins A. The effectiveness of distance interventions for increasing physical activity: a review. Am J Health Promot. 2009;24(2):102-17.	2009	2004 to 2006	English	Evaluate the effectiveness of distance physical activity interventions.	Adults	Any	RCT	USA, Australia, Canada, UK (Scotland)	ES: range of SMD -0.2 to 0.45	Narrative review
Fjeldsoe BS. Behavior change interventions delivered by mobile telephone short-message service. Am J Prev Med. 2009;36(2):165-73.	2009	1990 to 2008	English	To review the current research examining mobile telephone short-message service for delivering health behavior change interventions via text messages.	Adults	Community	RCT;pre-post-test	UK	ES=SMD=0.82	Narrative review
De Meester F. Interventions for promoting physical activity among European teenagers: a systematic review. Int J Behav Nutr Phys Act. 2009;6:82.	2009	1995 to 2008	English	To summarize the effectiveness of interventions to promote physical activity among European teenagers.	Adolescents (mean ages:10 and 19 years)	Community, health care, school	RCT, QE, pre-post-test	UK (Scotland), Sweden, Greece, Belgium, Ireland, France, Netherlands, Spain	ES=SMD range=-1.06-2.79	Narrative review
Hutchison AJ. Physical Activity Behavior Change Interventions Based on the Transtheoretical Model: A Systematic Review. Health Educ Behav. 2009;36(5):829-45	2009	1982 to 2007	English	To critically examine how the TTM is being applied to develop PA behavior change interventions and to determine whether these TTM-based interventions are effective in promoting PA behavior change.	All	Community, health care	RCT, QE	USA, UK, Australia, South Korea	NAES	Narrative review

Cobiac LJ. Cost-Effectiveness of Interventions to Promote Physical Activity: A Modelling Study. PLoS Med. 2009;6(7):e1000110.	2009	2001 to 2006	English	To evaluate the cost-effectiveness of interventions to promote physical activity.	Adults	Community, health care, environment	RCT, QE, meta-analysis	Australia	ES= target group range: 57-574Met/min/wk	Narrative review
Lubans DR. A systematic review of studies using pedometers to promote physical activity among youth. Prev Med. 2009;48(4):307-15	2009	Up to December 2008	English	To identify the effectiveness of pedometers in promoting physical activity among youth.	Children and adolescents (5-18 years)	Community, health care, school	RCT, QE	USA, Canada, Australia, New Zealand, UK	NAES	Narrative review
O'Connor TM. Engaging Parents to Increase Youth Physical Activity: A Systematic Review. Am J Prev Med 2009;37(2):141-149.	2009	1980 to 2008	English	To identify how best to involve parents in physical activity interventions for children.	Children and adolescent	Community, health care, school, preschool, home, WIC	RCT, QE, pre-post-test, pilot study	USA	NAES	Narrative review
Whitt-Glover MC. Systematic Review of Interventions to Increase Physical Activity and Physical Fitness in African-Americans. Am J Health Promot. 2009;23(6):S33-56.	2009	1985 to 2006	NS	To identify characteristics of effective interventions designed to increase physical activity or fitness among African-Americans.	Children (7 to 17 years) and adults (18 to 91 years)	Community, health care, schools, churches, workplace.	RCT, QE, UCT	USA	NAES	Narrative review
Michie S. Effective techniques in healthy eating and physical activity interventions: a meta-regression. Health Psychol. 2009;28(6):690-701.	2009	1990 to 2008	English	To assess the effectiveness of active behavior change interventions designed to promote physical activity and healthy eating.	Adults (≥ 18 years)	Community, health care, work place	RCT, QE	UK, USA, Australia, Canada, Europe, Japan	ES=SMD: 0.31 (95% CI 0.26-0.38).	Meta-analysis

Neville LM. Computer-tailored physical activity behavior change interventions targeting adults: a systematic review. Int J Behav Nutr Phys Act. 2009;6:30.	2009	1996 to 2008	English	To provide a narrative systematic review describing the range of evidence on 'second' and 'third' generation computer-tailored primary prevention interventions for physical activity.	Adults	Community, health care, workplace, military	RCT, QE	Australia, USA, UK, Belgium, New Zealand	NAES	Narrative review
Rhodes RE. A Review and Meta-Analysis of Affective Judgments and Physical Activity in Adult Populations. Ann Behav Med. 2009;38(3):180-204.	2009	1989 to 2009	English	To review affective judgment constructs employed in physical activity research to assess the relationship with behavior.	Adults (≥ 18 years)	Community, health care., university	RCT, QE, cohort, pre-post-test, cross-sectional.	Australia, Canada, China, Europe, United States, New Zealand	ES= r: 0.42 (95% CI 0.37 to 0.46)	Meta-analysis
Brown AS. Promoting physical activity amongst adolescent girls. Issues Compr Pediatr Nurs. 2009;32(2):49-64.	2009	1994 to 2009	English	To review studies investigating physical activity interventions designed specifically for adolescent girls.	Adolescent girls (9-19 years)	Community, school, church, home.	RCT, QE	USA, Canada, Sweden, Australia	NAES	Narrative review
Faulkner GAJ. Active school transport, physical activity levels and body weight of children and youth: A systematic review. Prev Med. 2009;48(1):3-8.	2009	1945 to 2008	English	To conduct a systematic review to assess if children who actively commute to school more physically active than children who travel by motorized transport.	Children and adolescents (5-18 years)	Community, schools	Cross-sectional, cohort	UK (Scotland, England), Denmark, Cyprus, USA, Philippines, Australia, New Zealand	NAES	Narrative review

NICE. Promoting physical activity, active play and sport for pre-school and school-age children and young people in family, pre-school, school and community settings.	2009	1990 to 2007	English	To increase the number of children and young people who regularly walk, cycle and use other modes of physically active travel.	Children and adolescents (<19 years)	Family, school, community	Systematic reviews.	UK (England)	NA	Narrative review
Krishna S. Healthcare via cell phones: a systematic review. <i>Telemed J E Health</i> . 2009;15(3):231-40.	2009	1950 to 2008	NR	To evaluate the empirical evidence related to the role of cell phones and text messaging interventions in improving health outcomes and processes of care.	Children and adults	Health care	RCT, QE	USA, Australia, UK, South Korea, New Zealand, Spain, Austria, China, Croatia, Italy, France, Netherlands, Norway	NAES	Narrative review
Beets MW. After-school program impact on physical activity and fitness. A meta-analysis. <i>Am J Prev Med</i> . 2009;36(6):527-37.	2009	1980 to 2008	English	To summarize the research regarding the effectiveness of after school programs in increasing physical activity.	Children and adolescents (≤18 years)	School	RCT, QE	USA, Australia, Spain	ES=SMD: 0.44 (95% CI 0.28–0.60)	Meta-analysis
Dobbins M. School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6-18. <i>Cochrane Database Syst Rev</i> . 2009;(1):CD007651.	2009	Up to July 2007	NR	To summarize the evidence of the effectiveness of school-based interventions in promoting physical activity and fitness in children and adolescents.	Children and adolescents (6-18 years)	School	RCT, QE, cohort	USA, France, Norway, Belgium, Germany, Greece, Australia, Russia.	NAES	Narrative review

Conn VS. Meta-Analysis of workplace physical activity interventions. Am J Prev Med 2009;37(4):330-9	2009	1969 to 2007	English	To integrate the extant wide range of worksite physical activity intervention research	Adults	Workplace	RCT, QE, pre-post-test, otros revisar	US, Australia, New Zealand	ES=SMD:0.21, 95% CI (0.11-0.31)	Meta-analysis
Johnson BT. Meta-synthesis of health behavior change meta-analyses. Am J Public Health. 2010;100(11):2193-8.	2010	1972 to 2003	English	To compare meta-analytic findings across diverse behavioral interventions to characterize how well they have achieved change in health behavior.	Adults	Community, health care	Meta-analysis	NS	ES=SMD:0.22, 95% CI (0.20, 0.23)	Review of reviews
Krebs P. A meta-analysis of computer-tailored interventions for health behavior change. Prev Med. 2010;51(3-4):214-21.	2010	1988 to 2009	English	To use meta-analytic techniques to assess the mean effect for computer-tailored interventions on four health behaviors.	Children and adults	Community, health care, work place, school	RCT, QE	USA, New Zealand, Australia, Europe	ES=SMD: 0.16, 95% CI=(0.10–0.21)	Meta-analysis
Ashford S. What is the best way to change self-efficacy to promote lifestyle and recreational physical activity? A systematic review with meta-analysis. Br J Health Psychol. 2010;15(Pt 2):265-88.	2010	1966 to 2007	English	To conduct a meta-analysis of the effectiveness of interventions to alter self-efficacy, in the context of physical activity interventions.	Adults (Mean age=43 years)	Community, health care, workplace, college/university,	RCT, QE, pre-post-test	Australia, New Zealand, UK, USA	ES=SMD for self-efficacy :0.16, IC95% (0.08-0.25)	Meta-analysis
Yang L. Interventions to promote cycling: systematic review. BMJ. 2010;341:c5293.	2010	Up to 2010	NR	To determine what interventions are effective in promoting cycling.	Children and adults	Community, school, work place	RCT, QE, observational	USA, UK (England), Australia, Denmark, Netherlands, Sweden, Germany	ES= net increases of up to 3.4 percentage points in the population prevalence of cycling or the proportion of trips made by bicycle. Net effect equating to an average of 8	Narrative review

									additional cycling trips per person per year.	
Pucher J. Infrastructure, programs, and policies to increase bicycling: an international review. <i>Prev Med.</i> 2010;50 Suppl 1:S106-25.	2010	1990 to 2010	English	To assess existing research on the effects of various interventions on levels of bicycling.	Children and adults	Community, Schools	QE, observational, case studies	Canada, USA, Denmark, Germany, Netherlands, Spain, France, UK, Australia, Japan, Colombia	NAES	Narrative review
Lin JS. Behavioral Counseling to Promote Physical Activity and a Healthful Diet to Prevent Cardiovascular Disease in Adults: Update of the Evidence for the U.S. Preventive Services Task Force. <i>Evidence Synthesis No. 79.</i> Agency for Healthcare Research and Quality (US). 2010; Report No.: 11-05149-EF-1.	2010	2001 to 2009	English	To assist the U.S. Preventive Services Task Force (USPSTF) in updating its 2002 and 2003 recommendations on counseling to improve physical activity and diet.	Adults	Health care	RCT, QE	UK, New Zealand, Sweden, USA, Japan, Canada, Finland, Netherlands, Spain, Australia, Belgium	ES=SMD= self reported PA: 0.16; 95%CI (0.10-0.22); RR: 1.23 95% CI (1-12-1.34); Minutes increased of PA per week: 38 minutes/wk; 95% CI (25.9-50.7) for medium intensity interventions.	Meta-analysis

Ruppar TM. Interventions to promote physical activity in chronically ill adults: Practice implications of clinical studies. Am J Nurs. 2010;110(7):30-7; quiz 38-9.	2010	Up to 2008	NS	To discuss the implications of those findings, describing the strategies and practices commonly used to promote physical activity in chronic illness and identifying those that are most effective.	Adults	Health care	Meta-analysis	NS	ES= 945 steps per day; 48 minutes/wk	Narrative review
Webb,TL. Using the Internet to Promote Health Behavior Change: A Systematic Review. J Med Internet A43Res. 2010. 12(1): e4.	2010	2000 to 2008	English	To investigate which characteristics of Internet-based interventions best promote health behavior change	Internet-based	NS	RCT	NS	ES=SMD=0.24	Meta-analysis
Nocon M. Increasing physical activity with point-of-choice prompts: a systematic review. Scandinavian Journal of Public Health 2010; 38(6): 633-638	2010	2001 to 2008	English	To assess the effectiveness of point-of-choice prompts for the promotion of stair climbing.	All	University, public transport stations, shopping malls, library, hospital, airport, parking garage, bank, and office buildings	Point of choice intervention to promote stair climbing	UK, USA, Australia, Hong Kong, Denmark	ES= increased: 0.3%-10.6%; OR range:1.05-2.93	Narrative review
Chau JY. Are workplace interventions to reduce sitting effective? A systematic review. Prev Med. 2010;51(5):352-6.	2010	Up to 2009	English, Chinese, Dutch, French, German, Italian, Norwegian, Spanish	To systematically review the effectiveness of worksite interventions for reducing sitting.	Adults (mean ages 39-45 years)	Workplace	RCT, QE, pre-post-test	Finland, Australia, Spain, UK, Belgium, Norway, Canada.	NA	Narrative review

Fjeldsoe B. Systematic review of maintenance of behavior change following physical activity and dietary interventions. Health Psychol. 2011;30(1):99-109.	2011	2000 to 2009	English	To review the evidence for maintenance of physical activity and/or dietary behavior change following intervention (follow-up).	Adults	Any	RCT	Germany, USA, Netherlands, Switzerland, UK (Scotland), Australia, Canada	NA	Narrative review
Baker PR. Community wide interventions for increasing physical activity. Cochrane Database Syst Rev. 2011;(4):CD008366.	2011	1995 to 2009	NR	To evaluate the effects of community wide, multi-strategic interventions upon population levels of physical activity.	Adults	Community	RCT, QE, cohort, interrupted time series	Australia, USA, China, Iran, Pakistan, Belgium, Norway, Netherlands, Finland, Canada, Denmark, France	NAES	Narrative review
van Sluijs EM. The effect of community and family interventions on young people's physical activity levels: a review of reviews and updated systematic review. Br J Sports Med. 2011;45(11):914-22.	2011	2007 to 2010	NR	To review the effectiveness of interventions to promote PA in children and adolescents, delivered in the family and community setting.	Children and adolescents (≤ 18 years)	Community	RCT, QE	NS	NAES	Review of reviews
Perez A. Review of Intervention Studies Promoting Physical Activity in Hispanic Women. West J Nurs Res. 2010; 32(3): 341-362.	2011	1980 to 2010	English	To provide a comprehensive review and evaluation of intervention studies designed to promote physical activity among Hispanic women.	Women (24-70 years)	Community, health care, schools, home-based	RCT, participatory action research	USA	ES=0.21 to 1.4	Narrative review

Conn VS. Interventions to increase physical activity among healthy adults: meta-analysis of outcomes. Am J Public Health. 2011 Apr;101(4):751-8.	2011	1960 to 2007	English	To summarize the effects of interventions designed to increase physical activity among healthy adults.	Adults	Community, health care, work place	RCT, QE	NS	ES= SMD=0.19 95% CI(-0.14-0.53); minutes/wk=14.7 95 % CI (-11-40.3) minutes per week.	Meta-analysis
Williams SL. What are the most effective intervention techniques for changing physical activity self-efficacy and physical activity behaviour—and are they the same?. Health Educ Res. 2011;26(2):308-22.	2011	1966 to 2007	English	To estimate the association between specific intervention techniques used in physical activity interventions and change obtained in both self-efficacy and physical activity behaviour.	Adults (Mean age 43.17 years)	Community, health care, workplace, college/university, home-based	RCT, QE, pre-post-test	NS	ES SMD= physical activity self-efficacy = 0.16, 95% CI (0.08–0.24); SMD physical activity behaviour=0.21, 95% CI (0.11-0.31)	Meta-analysis
Webb OJ. A statistical summary of mall-based stair-climbing interventions. J Phys Act Health. 2011;8(4):558-65.	2011	1970 to 2008	English	To summarize the effectiveness of mall-based stair-climbing interventions, while controlling for, and examining, potential moderators of stair/escalator choice.	All	Environment	QE	UK	ES intervention vs baseline= OR=2.09, 95% CI (1.8–2.4)	Meta-analysis-pooled analysis
Greaves C. Systematic review of reviews of intervention components associated with increased effectiveness in dietary and physical activity interventions. BMC Public Health. 2011;11:119.	2011	1998 to 2008	English	To identify intervention components that are associated with increased change in diet and/or physical activity in individuals at risk of type 2 diabetes.	Adults (≥ 18 years)	Multiple	Systematic reviews	NS	ES=increased physical activity= 30-60 minutes of walking per week at 12-18 months; SMD around=0.30. Range of SMD of included studies= 0.28 95% CI (0.12-0.41) to 0.52 95% CI (0.14-0.90). OR 1.2 to 1.3	Review of reviews

Gourlan MJ. Interventions promoting physical activity among obese populations: a meta-analysis considering global effect, long-term maintenance, physical activity indicators and dose characteristics. <i>Obes Rev.</i> 2011;12(7):e633-45.	2011	1996 to 2010	English	To determine the global effect that interventions promoting PA among obese populations have on their PA behaviour	All	Multiple	RCT, QE	NS	ES= mean 0.54 (95% CI=0.39, 0.69))	Meta-analysis
Durand CP. A systematic review of built environment factors related to physical activity and obesity risk: implications for smart growth urban planning. <i>Obes Rev.</i> 2011;12(5):e173-82	2011	1990 to 2009	English	To utilize existing built environment research on factors that have been used in smart growth planning to determine whether they are associated with physical activity or body mass.	Children and adults	Other sectors	Cross-sectional, cohort study	Australia, Canada, Belgium	NAES	Narrative review
Medina-Blanco RI. Intervention programs to promote physical activity in school children: systematic review. <i>Nutr Hosp.</i> 2011;26(2):265-70.	2011	2000 to 2010	English, Spanish	To assess physical activity promotion programs in school children from 6 to 12 years old.	Children (6-12 years)	School	RCT, QE	USA, Belgium, Denmark, Sweden, Canada, Australia, Spain	NAES	Narrative review
Chillón P. A systematic review of interventions for promoting active transportation to school. <i>Int J Behav Nutr Phys Act.</i> 2011;8:10.	2011	Up to January 2010	English	To review intervention studies related to active school transportation to guide future intervention research.	Children and adolescents (6-18 years)	School	RCT, QE, pre-post-test	USA, Australia, UK	ES= SMD range= 0.07-1.21. Increase in the percentage of active transportation to school range 3% to 64%.	Narrative review

Kriemler S. Effect of school-based interventions on physical activity and fitness in children and adolescents: a review of reviews and systematic update. Br J Sports Med. 2011;45(11):923-30.	2011	2007 to 2010	NR	To summarise recent reviews that aimed to increase PA or fitness in youth and carry out a systematic review of new intervention studies.	Children and adolescents (6-18)	School	RCT, QE	USA, Canada, Europe, Brazil, Iran	47%-65% of the studies were effective	Review of reviews
Hamel LM. Computer- and web-based interventions to increase preadolescent and adolescent physical activity: a systematic review. J Adv Nurs. 2011;67(2):251-68.	2011	1998 to 2010	English	To examine evidence regarding computer- or web-based interventions to increase preadolescent and adolescent physical activity.	Children and adolescents (8-18 years)	School, scout- troop, home, camp	RCT, QE	USA, Belgium	NAES	Narrative review

RCT= Randomized controlled trials. QE=Quasi-experimental design. UCT= uncontrolled trial. NA= Not available. NS= none specified. NR=No restriction on language was reported in the search strategy. ES= Effect size estimates. SMD= standardized mean difference. NAES=results from studies were presented but a summary of pooled or a range of comparable effect size estimates from all evaluated studies were not available due to different measurement scales. IQ range= interquartile range. MVPA= moderate to vigorous physical activity. USA= United States of America. UK=United Kingdom. ES= Effect estimates, OR: odd ratio. TTM=Transtheoretical Model.