

## 2015-2018 Regional Prevention Plan of Lombardy (Northern Italy) and sedentary prevention: a cross-sectional strategy to develop evidence-based programmes

La prevenzione della sedentarietà nel Piano regionale della prevenzione lombardo 2015-2018: una strategia intersettoriale per lo sviluppo di programmi evidence-based

Liliana Coppola,<sup>1</sup> Ennio Ripamonti,<sup>2</sup> Danilo Cereda,<sup>1</sup> Giusi Gelmi,<sup>3</sup> Lucia Pirrone,<sup>1</sup> Andrea Rebecchi<sup>4</sup>

<sup>1</sup> Welfare General Directorate, Lombardy Region, Milan

<sup>2</sup> University of Milano-Bicocca, Milan

<sup>3</sup> Health territorial agency "Milano – città metropolitana", Milan

<sup>4</sup> Department of Architecture, Built environment and Construction engineering (ABC), University "Politecnico di Milano", Milan

**Corresponding authors:** Liliana Coppola; liliana\_coppola@regione.lombardia.it – Andrea Rebecchi; andrea.rebecchi@polimi.it

### ABSTRACT

Cross-sector, life-course, and setting approaches are identified in the 2015-2018 Regional Prevention Plan (PRP) of Lombardy Region (Northern Italy) as valuable strategies to ensure the efficacy and sustainable prevention of the non-communicable disease (NCDs). The involvement of non-health sectors in health promotion activities represents a suitable strategy to affect on social, economic, and political determinants and to change environmental factors that could cause NCDs. A dialogue among communities, urban planning, and prevention know-how is a prerequisite to develop a system of policies suitable to promote healthy lifestyle in general and, specifically, active lifestyles. The 2015-2018 Lombardy PRP pursues its aims of health promotion and behavioural risk factors for NCDs prevention through programmes that implement their own setting networks (Health Promoting Schools – SPS; Workplace Health Promotion – WHP) and develop new networks. Sedentary lifestyle prevention and active lifestyle promotion are performed through the approach promoted by the Healthy Cities Programme (WHO), encouraging two main processes: 1. creating integrated capacity-building among health and social prevention services, academic research, and local stakeholders on different urban planning and design issues; 2. promoting community empowerment through active citizens participation. Through this process, Lombardy Region aims to orient its services developing evidence-based programmes and enhancing advocacy and mediating capacity skills in order to create a profitable partnership with non-health sectors. This paper reports the main impact data: 26,000 children that reach school by foot thanks to walking buses, 57% of 145 companies joining WHP are involved in promoting physical activity, 18,891 citizens who attend local walking groups.

**Keywords:** health promotion, urban and spatial planning, cross-sectional process, sedentary prevention, physical inactivity, active mobility

### RIASSUNTO

Il coinvolgimento di settori non sanitari nei processi di prevenzione e promozione della salute rappresenta un fattore strategico per potenziare l'impatto delle politiche sanitarie agendo anche su determinanti sociali, economici, politici e ambientali alla base delle patologie cronico-degenerative. In particolare, il dialogo tra il sistema sanitario e il *know-how* in tema di pianificazione urbana, rigenerazione urbanistica e sociale, trasporti ed *empowerment* di comunità rappresenta una sfida per realizzare *policy* e *capacity building* di promozione della salute. Presupposti per la collaborazione proficua di attori diversi sono la costruzione e la cura di reti intersettoriali. Il Piano regionale della prevenzione (PRP) lombardo 2015-2018 ha recepito questo approccio sviluppando programmi di rete con le scuole (rete delle scuole che promuovono salute – SPS) e con le aziende (rete delle aziende che promuovono salute – WHP) e adottando la strategia del progetto "Città sane" dell'Organizzazione mondiale della sanità, che si prefigge sviluppo di *capacity building* integrata tra servizi di prevenzione e *stakeholder* del territorio e della ricerca (i gruppi di cammino ne sono un esempio). I principali dati di impatto, in relazione alla prevenzione della sedentarietà, confermano la validità della strategia intersettoriale per i nuovi obiettivi (PRP 2015-2018): nella fascia dell'infanzia, 26.000 bambini vanno a scuola a piedi (pedibus); nella fascia degli adulti in età lavorativa il 57% delle 145 aziende aderenti al WHP sono coinvolte nell'area attività fisica; nella fascia degli adulti/anziani 18.891 cittadini aderiscono ai gruppi di cammino.

**Parole chiave:** promozione della salute, pianificazione urbanistica e territoriale, intersettorialità, prevenzione sedentarietà, inattività fisica, mobilità attiva

**INTRODUCTION**

Investing in prevention of non-communicable diseases (NCDs) can reduce premature deaths, preventable morbidity and disability, and improve the quality of life and wellbeing of individuals and society. In the WHO European Region, at least 86% of deaths and 77% of the burden of disease are caused by NCDs, which have in common underlying determinants and modifiable risk factors (figure 1).<sup>1</sup>

Lifestyle, that plays a key role in people health, is strongly influenced by physical, organisational, social, and cultural contexts. Concerning that, WHO defines lifestyle as «a way of living based on identifiable profiles of behaviour that are determined by the interconnection between individual characteristics, social interactions, and socioeconomic and environmental issues».<sup>2</sup>

Scientific evidence and international recommendations point out that it is necessary to implement different integrated prevention programmes based on health promotion strategies, in order to encourage healthy lifestyles adoption.<sup>3</sup> Healthy lifestyles programmes and healthy environments are more effective if a multi-component approach is adopted. They should affect all health determinants, be cross-sectoral (educational, social, urban planning, transport, agriculture, etc.), adopt a life-course approach, and address different settings (schools, workplaces, local communities, health services). It is also very important to promote community empowerment involving all the stakeholders: local communities, decision-makers, and practitioners.<sup>2</sup>

One example is sedentary prevention through the promotion of an active lifestyle.<sup>4</sup> This is a public health priority objective: in 2013, 42% of Europeans and 60% of Italians were sedentary.<sup>5</sup> In Lombardy Region, a sedentary lifestyle was a common behaviour in childhood, adolescence, and among adult population (34%; Istat 2013),<sup>6</sup> though the problem is less serious than in other areas of

the Country.<sup>6</sup> This health issue requires models that take into account complexity and different responsibilities. To promote an active lifestyle, it is necessary both to implement programmes for improving personal skills and to influence environmental determinants, such as urban structure, mobility organisation, social networks, ect.<sup>7-9</sup>

**OBJECTIVES**

«The prerequisites and prospects for health cannot be ensured by the health sector alone. Health promotion demands coordinated action by governments, health, and other social and economic sectors, nongovernmental and voluntary organisations, local authorities, industry and the media [...]».<sup>10</sup> The aim of this paper is to describe the activities of the health sector in Lombardy Region which intends to create interconnections among different sectors to affect positive changes on health and wellbeing of the communities. In this regard, sedentary lifestyle prevention programmes carried on in Lombardy are a good example. Within the Lombardy Regional Prevention Plan (PRP) 2015-2018, these programmes are carried out thanks to the cooperation of different sectors.<sup>11</sup>

**DESIGN AND METHODOLOGY**

In Italy, the most important document about planning of prevention activities and strategies is the “Prevention plan”. Lombardy PRP 2015-2018 includes all the prevention programmes (including those on active lifestyle) about health promotion and behavioural risk factors. This document follows the national recommendations, which incorporate European guidelines, and it is based on the lessons learned from scientific literacy reported above. The Regional Government follows the process described in figure 2.

According to the PRP, every year Health Territorial Agencies (ATSs) arrange the Local integrated plan (PIL) of health promotion, which is the tool used to plan all the

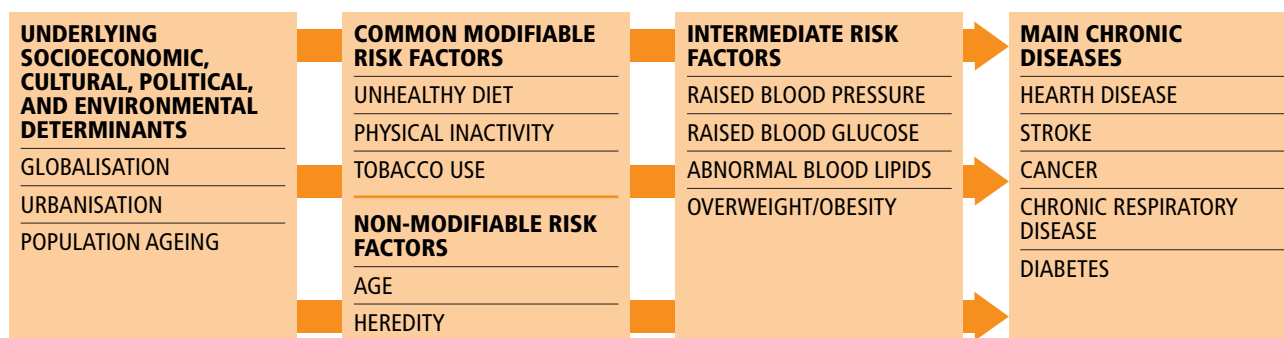


Figure 1. Causes of chronic diseases (WHO 2008).<sup>1</sup>  
 Figura 1. Cause di malattie croniche (WHO 2008).<sup>1</sup>

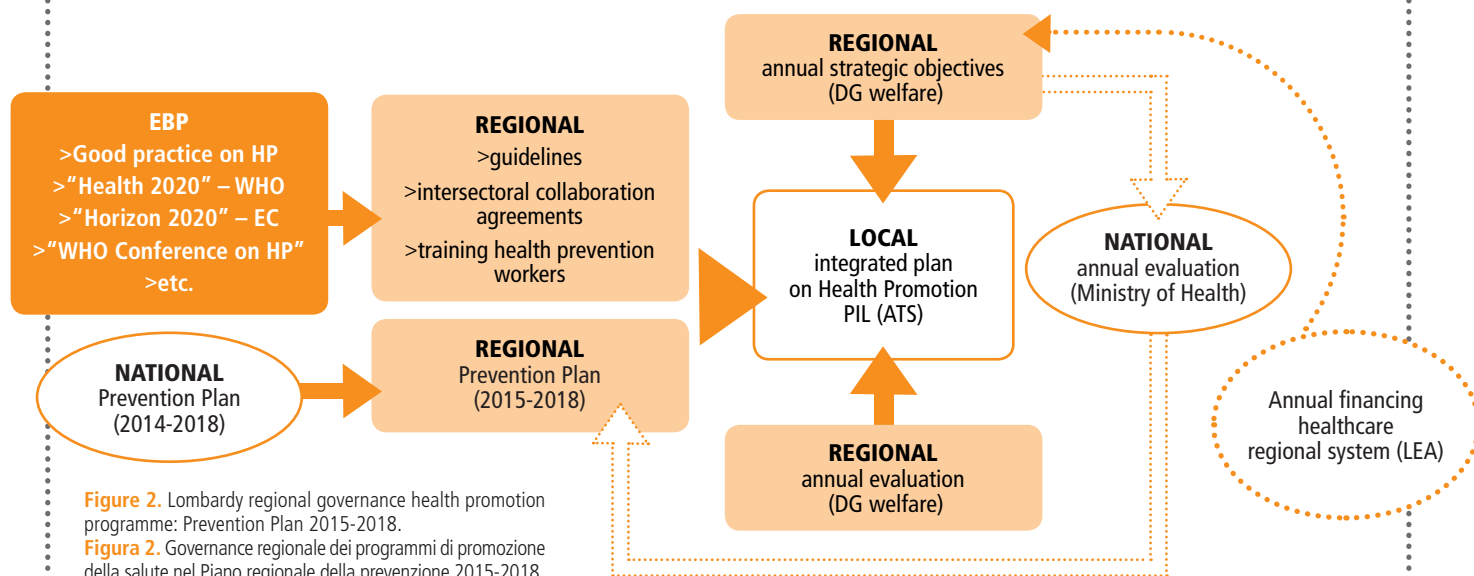


Figure 2. Lombardy regional governance health promotion programme: Prevention Plan 2015-2018.

Figura 2. Governance regionale dei programmi di promozione della salute nel Piano regionale della prevenzione 2015-2018.

activities aimed at promoting healthy environments and healthy lifestyles. The main feature of a PIL is its institutional integration. Different sectors<sup>12</sup> (healthcare system, social system, municipalities, nongovernmental organisations, law enforcement, schools, policy makers, companies) and different professional figures (physicians, nurses, psychologists, educators, urban planners, teachers, ect) integrate their know-out in order to enable a real and measurable health gain in the population. Consistent with the data from its territory, the PILs specify:

- aims of every ATS;
- priorities of interventions;
- methodologies and tools for active health promotion;
- expected outcomes/achievements.

The promotion of physical activity is integrated with the promotion of healthy eating lifestyles as well as the other health/risk factors, such as smoking. The methodology is based on regional guidelines,<sup>13</sup> and are oriented to appropriateness criteria such as effectiveness, integration, intersectorality, and sustainability.<sup>14,15</sup> Many interventions are included in network programmes (workplace and school) and/or are carried out with the involvement of local authorities, associations, and local stakeholders.

Promoting physical activity is the most developed aspect by ATSs. Even if any ATS implements its own interventions in this field, some interventions are realised by all Lombardy ATS:

- walking bus and health promoting schools (Lombardy Network);
- workplace health promotion (Lombardy WHP Network);
- walking groups.

The promotion of physical activity bridges between the

action of the health sector and the action of other sectors of society: the health sector alone cannot change health behaviours, but it can try to activate community resources (associations, administrations, etc) to promote physical activity in a sustainable way.

## RESULTS

In the last years, all ATSs had activated many programmes to promote physical activity in all age groups, with more attention to younger people (figure 3).<sup>16</sup>

Here below, the list of the main activities implemented in Lombardy Region which contribute to promoting an active lifestyle. The sustainability of these projects is possible thanks to the profitable collaboration among organisations (schools, workplaces, etc.) other than healthcare system.

### WALKING BUS AND HEALTH PROMOTING SCHOOLS: THE SPS REGIONAL NETWORK

In 2015 about 26% of Lombardy schools joined the Health Promoting School (SPS) regional network (about 270,000 6-18-year-old students). The SPS is a network of schools that work together to make school a better place in which students can learn, work, and live. They undertook evidence-based activities, under different categories: educational, social, and organisational.

According to a recent Cochrane review, school-based intervention proved to be moderately effective in increasing the number of children engaged in physical activity.<sup>17</sup> Many factors, such as local road environment, family and neighbourhood socioeconomic conditions, influence the physical activity level in school-aged children.<sup>18-20</sup>

In Lombardy, SPSs and ATSs have work together to pro-

HEALTH PROMOTION PROGRAMMES BY AGE GROUP 2010-2015

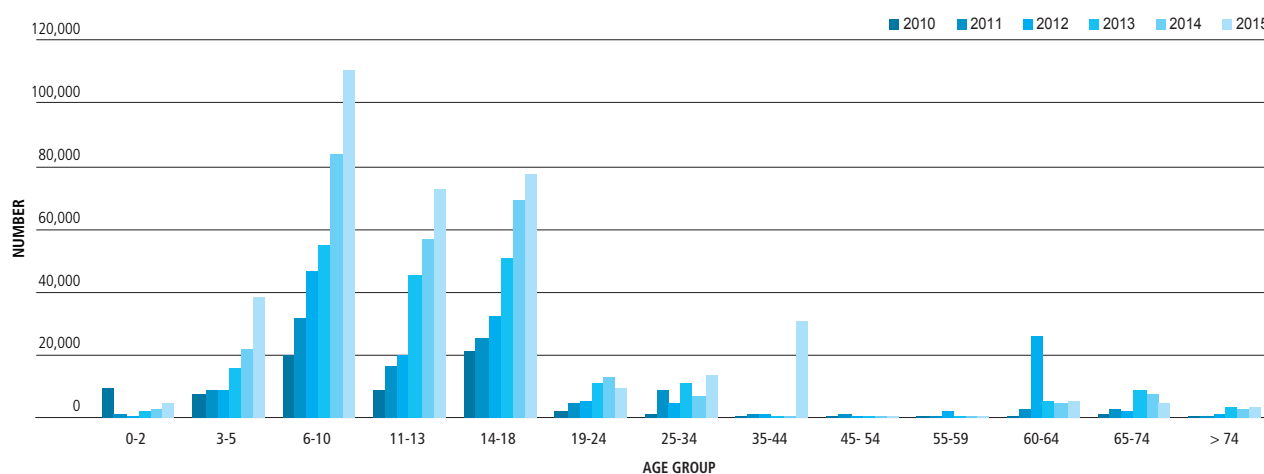


Figure 3. Promotion of physical activity by age group. Lombardy Region, 2010-2015.  
Figura 3. Promozione dell'attività fisica per fasce di età. Regione Lombardia, 2010-2015.

mote walking bus: children, accompanied by adult volunteers, go to school on foot following a predetermined safe route with different stops. Last survey (March 2014)<sup>21</sup> found that walking buses are present in 341 municipalities (22% of Lombardy municipalities). Currently, 26,000 children, 57% of children aged 6-10 years who live in Lombardy, go to school by walking bus. The schools involved are 501 (table 1).

**PHYSICAL ACTIVITY AND WORKPLACE HEALTH PROMOTION: THE LOMBARDY WHP NETWORK**

The Workplace Health Promotion (WHP) Network is made up of companies which undertake different actions to become an “environment conducive to health”, with the support of the relative ATS, if necessary. These actions involve: training, counselling, information campaigns (smoking cessation, healthy eating, indoor wellbeing, natural lighting, etc.);<sup>22</sup> organisational improvements (canteens, snack vending machines, etc.); collaboration with local communities.

There is a growing body of knowledge on evidence-based physical activity interventions at workplace. Pedometer-based programmes, stairs campaigns, wellness facilities,

and walk-to-work interventions are effective in increasing physical activity.<sup>23</sup>

Physical activity works with sustainable mobility: a urban planning able to guarantee a safe pathway from home to work could replace short car trips by walking and cycling; this replacement coincides with the recommended levels of daily physical activity of moderate intensity.<sup>24</sup>

Moreover, individuals with a supportive work environment are more likely to use time at work to exercise.<sup>25</sup>

Currently, in Lombardy 57% of the 145 companies which joined the WHP Network are engaged in physical activities (information campaigns involved 70,000 workers, agreements between companies and sports facilities concern 38,000 workers, and 18,000 workers support the promotion of the use of bicycle).

**WALKING GROUPS**

Walking groups are groups of people who regularly walk together. Initially led by practitioners, they have gradually become self-sustaining through walking leaders, identified among specifically-trained volunteers.

Many studies show how factors related to the environment (e.g., protection from crime, population density,

WALKING GROUPS				WALKING BUSES			
People involved in WG (No.)	People over 65 (No.)	Rate in 65-74 years old age group (%)	Municipalities with WG (%)	Children involved in WB (No.)	Rate in 6-10 years old age group (%)	Schools with WB (%)	Municipalities with WB (%)
18.891	11.488	11	27	26.629	57	21	22

Source: DG welfare, Lombardia 2014<sup>11</sup> / Fonte: DG welfare, Lombardia 2014<sup>11</sup>

Table 1. Walking groups (WG) and walking buses (WB) in Lombardy Region.

Tabella 1. Gruppi di cammino (WG) e pedibus (WB) in Lombardia.

traffic conditions, public walking tracks, etc.) influence walking behaviours.<sup>26,27</sup>

In March 2014 a survey took this picture: the 8 Lombardy ATs had activated walking groups through the involvement of municipalities and associations. Walking groups involve 18,891 participants (of which 11,488 are >65 years old), with some groups dedicated to patients with specific ailments (e.g., diabetes, motor disability). Further walking groups arise from activities undertaken by Network members (WHP, Health Promoting Schools, Healthy Cities, etc.).

Europe Health Economic Assessment Tool (HEAT),<sup>28</sup> a tool developed by WHO and based on a statistical model, calculates health gains for walking group participants. Estimating an average period of walking of 120 minutes per week at a slow pace (two walks of 1 hour for 4.8 km/h) (18,891 people), HEAT calculates that the activity may decrease the mortality risk by 14% in walking group participants compared to a sedentary population. The decrease in risk cannot be related to the individual, but it is a good representation of the actual health gain activity.

### DISCUSSION AND CONCLUSION

Lombardy Region has long been engaged in the development of cross-sectoral programmes, based on actions promoting effective and sustainable lifestyles and environments conducive to health, reaching the community and taking into account the risk of inequality.

The 2015-2018 Lombardy PRP, a three-year programmatic document, applies this cross-sectoral prospect and creates organisational, economic, and human resources to actually realise it. The PRP is made of different interconnected sub-programmes. Each of them has specific aims and targets and plans activities involving different stakeholders through partnership with organisations (schools, workplaces, etc.) other than healthcare system. To achieve this, it is necessary to have a method and effective tools to enable individuals and organisations to work together and achieve shared goals through a participatory process, which is based on the actual cohesion between promoters (institutions) and participants (citizens) in the initiative.

For example, the involvement of local stakeholders is an important step towards ensuring the sustainability of school activities as the walking bus. It is essential to build environments which are more conducive to walking, ensuring engineering improvements recommended in master municipal plans and budgets (e.g., signage and road crossing upgrades; walking, biking and traffic-calming built infrastructure).

In the end, benefits may include increased physical activity, reduced traffic congestion, improved air quality, enhanced neighbourhood safety, and a greater sense of community. The Workplace Health Promotion experience helps to understand that, because people spent their life in buildings (workplaces or schools) and moving from one place to another, improving the environment to facilitate physical activity represents a great opportunity to promote health.<sup>29,30</sup> Buildings and sites are deliberately designed to support a set of activities and to reinforce a set of cultural assumptions.<sup>31-33</sup> So, at the outset of any design, it can be said that behaviour causes environment.

However, as individuals and groups use buildings on a daily basis, they are affected by the built-in physical aspects of the building/site, such as the availability of space for different functions and the relationships among spaces. These relationships are mediated and moderated by individual and group knowledge and attitudes. Nonetheless, in the short term, environment influences behaviour.<sup>34</sup>

Finally, the walking groups are an example of application of the Toronto Charter for Physical Activity,<sup>5</sup> a tool that identifies the best investments to increase the level of physical activity of the population through the integration of different sectors: when the National health systems<sup>35</sup> and the territory management systems cooperate in order to develop an environment that can support physical activity, their action can be sustainable.

The experiences here described are examples of the relevance and the feasibility of cross-sectoral collaboration among local communities, precisely the health sector and the urban planning field.

The future achievement of the PRP cross-sectorial strategy is assigned specifically to the 4<sup>th</sup> sub-programme "Healthy lifestyles community promotion" (linked to the Healthy cities programme, promoted by WHO in 1986). Its aims are to support the development of local communities to make them able to promote health and wellbeing through the creation of cross-sector partnerships and the enhancement of local experiences.

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## REFERENCES

- World Health Organisation. *Preventing chronic diseases : a vital investment*. WHO global report. Geneva, WHO, 2005. Available from: [http://www.who.int/chp/chronic\\_disease\\_report/contents/en/](http://www.who.int/chp/chronic_disease_report/contents/en/)
- World Health Organisation. *Health Promotion Glossary*. Geneva, WHO, 1998. Available from: <http://www.who.int/healthpromotion/about/HPR%20Glossary%201998.pdf>
- World Health Organization. *Health21. The health for all policy framework for the WHO European Region*. European Health for All Series No. 6. Copenhagen Regional Office for Europe, 1999. Available from: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0010/98398/wa540ga199heeng.pdf](http://www.euro.who.int/__data/assets/pdf_file/0010/98398/wa540ga199heeng.pdf)
- Romano-Spica V, Macini P, Fara GM et al. Adapted Physical Activity for the Promotion of Health and the Prevention of Multifactorial Chronic Diseases: the Erice Charter. *Ann Ig* 2015;27(2):406-14.
- Global Advocacy Council for Physical Activity, International Society for Physical Activity and Health. *The Toronto Charter for Physical Activity: A Global Call to Action*. 2010. Available from: <http://www.iuhpe.org/images/PUBLICATIONS/THEMATIC/PA/TorontoCharterPhysicalActivityENG.pdf>
- Istat. *Indagine multiscopo sulle famiglie – Aspetti della vita quotidiana*. 2013. Available from: [www.istat.it/it/archivio/129916](http://www.istat.it/it/archivio/129916)
- Catford J. WHO is making a difference through health promotion. *Health Promot Int* 1999;14(1):1-4.
- World Health Organisation. *Health 2020. A European policy framework and strategy for the 21st century*. WHO Regional office for Europe 2013. Available from: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0011/199532/Health2020-Long.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0011/199532/Health2020-Long.pdf?ua=1)
- Capolongo S, Battistella A, Buffoli M, Oppio A. Healthy design for sustainable communities. *Ann Ig* 2011;23(1):43-53.
- World Health Organisation. *The Ottawa Charter for Health Promotion*. Geneva, WHO, 1986. Available from: <http://www.who.int/healthpromotion/conferences/previous/ottawa/en/index.html>
- Decision of the Lombardy Regional Council DGR n. 3654/2015. *Approvazione del Piano Regionale Prevenzione 2015-2018, ai sensi dell'intesa Stato-Regioni del 13 novembre 2014*.
- Capolongo S, Buffoli M, di Noia M, Gola M, Rostagno M. Current scenario analysis. In: Capolongo S, Bottero MC, Buffoli M, Lettieri M (eds). *Improving sustainability during hospital design and operation: a multidisciplinary evaluation tool*. Cham, Springer, 2015; pp. 11-22.
- Lombardy Region. Circular letter No. 21/SAN/2008 of 12.03.2008. Updated 2016. *Linee di indirizzo per l'aggiornamento dei Piani integrati locali degli interventi di promozione della salute – annualità 2009 e indicazioni per la rilevazione dell'attività svolta nel 2008*. Available from: [http://www.epicentro.iss.it/regioni/lombardia/pdf/circolare\\_piani\\_integrati\\_locali.pdf](http://www.epicentro.iss.it/regioni/lombardia/pdf/circolare_piani_integrati_locali.pdf)
- Capolongo S, Bottero MC, Lettieri E et al. Healthcare sustainability challenge. In: Capolongo S, Bottero MC, Buffoli M, Lettieri M (eds). *Improving sustainability during hospital design and operation: a multidisciplinary evaluation tool*. Cham, Springer, 2015; pp. 1-10.
- Lombardy Region. Circular letter No. 21 of 03.12.2008. *Linee di indirizzo per l'aggiornamento dei Piani integrati locali degli interventi di promozione della salute – annualità 2009 e indicazioni per la rilevazione dell'attività svolta nel 2008*. Available from: [normativaserviziir.lombardyregione.it/port/GetNormativaFile?fileName=1015\\_08\\_21san.pdf](http://www.serviziir.lombardyregione.it/port/GetNormativaFile?fileName=1015_08_21san.pdf)
- Coppola L, Zuffada R, Cassin M et al. *Promoting physical activity: An inter-sectorial activity between health and spatial planning*. *Urbani Izziv*, thematic issue, year 2015;(1):32-41. Available from: [http://urbani-izziv.uisr.si/Portals/uizziv/posebne\\_izzidaje/UI-thematic-issue-2015-1.pdf](http://urbani-izziv.uisr.si/Portals/uizziv/posebne_izzidaje/UI-thematic-issue-2015-1.pdf)
- Dobbins M, De Corby K, Robeson P, Husson H, Tirilis D. School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6-18. *Cochrane Database Syst Rev* 2013;(1):CD007651.
- Carver A, Timperio A, Hesketh K, Crawford D. Are safety-related features of the road environment associated with smaller declines in physical activity among youth? *J Urban Health* 2010;87(1):29-43.
- Pouliou T, Sera F, Griffiths L et al. Environmental influences on children's physical activity. *J Epidemiol Community Health* 2015;69(1):77-85.
- Pabayo R, Belsky J, Gauvin L, Curtis S. Do area characteristics predict change in moderate-to-vigorous physical activity from ages 11 to 15 years? *Soc Sci Med* 2011;72(3):430-38.
- Lombardy Region. *Promotion of physical activity and contrast to sedentary lifestyle: public health programmes in Lombardy*. Report May 2014. Available from: [http://www.promozionesalute.regione.lombardia.it/shared/ccurl/892/89/RL%20report%20attivit%C3%A0%20fisica\\_2014\\_en\\_def.pdf](http://www.promozionesalute.regione.lombardia.it/shared/ccurl/892/89/RL%20report%20attivit%C3%A0%20fisica_2014_en_def.pdf)
- Origgi L, Buffoli M, Capolongo S, Signorelli C. Light wellbeing in hospital: research, development and indications. *Ann Ig* 2011;23(1):55-62.
- Freak-Poli RL, Wolfe R, Wong E, Peeters A. Change in well-being amongst participants in a four-month pedometer-based workplace health program. *BMC Public Health* 2014;14:953.
- World Health Organisation. *Action Plan for implementation of the European Strategy for the Prevention and Control of Noncommunicable Diseases 2012–2016*. WHO Regional Office for Europe 2012. Available from: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0019/170155/e96638.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0019/170155/e96638.pdf?ua=1)
- Procter S, Mutrie N, Davis A, Audrey S. Views and experiences of behaviour change techniques to encourage walking to work: a qualitative study. *BMC Public Health* 2014;14:868.
- Sun G, Oreskovic NM, Lin H. How do changes to the built environment influence walking behaviors? A longitudinal study within a university campus in Hong Kong. *Int J Health Geogr* 2014;13:28.
- Capolongo S, Buffoli M, Oppio A. How to assess the effects of urban plans on environment and health. *Territorio* 2015;(73):145-51.
- Healtheconomicassessmenttool–HEAT Available from: <http://www.heatwalkingcycling.org/>
- Capolongo S, Buffoli M, Oppio A, Petronio MG. Sustainability and hygiene of building: future perspectives. *Epidemiol Prev* 2014;38(6) Suppl 2:46-50.
- D'Alessandro D, Buffoli M, Capasso L et al. Green areas and public health: improving wellbeing and physical activity in the urban context. *Epidemiol Prev* 2015;39(4) Suppl 1:8-13.
- Capolongo S, Buffoli M, Oppio A, Rizzitello S. Measuring hygiene and health performance of buildings: a multidimensional approach. *Ann Ig* 2013;25(2):151-57.
- Capolongo S, Buffoli M, Oppio A, Nachiero D, Barletta MG. Healthy indoor environments: how to assess health performances of construction projects. *Environmental Engineering and Management Journal* 2013;12(S11):209-12.
- Buffoli M, Capolongo S, Cattaneo M, Signorelli C. Project, natural lighting and comfort indoor. *Ann Ig* 2007;19(5):429-41.
- Zimring C, Joseph A, Nicoll GL, Tsepas S. Influences of building design and site design on physical activity: research and intervention opportunities. *Am J Prev Med* 2005;28(2) Suppl 2:186-93.
- Buffoli M, Capolongo S, Bottero M, Cavagliato E, Speranza S, Volpatti L. Sustainable healthcare: how to assess and improve healthcare structures' sustainability. *Ann Ig* 2013;25(5):411-18.