

passive, physical and mental life should be to assemble the best experts in the field and the best evidence to understand what we know about the relationship between human health and physical activity. This goal is the purpose of our Series.

Pamela Das, Richard Horton  
*The Lancet*, London NW1 7BY, UK

We warmly thank Pedro Hallal for devising and leading this Series, and I-Min Lee, Adrian Bauman, Mike Pratt, Harold Kohl III, and Gregory Heath for their contributions and support as *The Lancet* Series steering committee.

- 1 Beaglehole R, Bonita R, Horton R, et al, for *The Lancet* NCD Action Group and the NCD Alliance. Priority actions for the non-communicable disease crisis. *Lancet* 2011; **377**: 1438–47.
- 2 Lee I-M, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT, for the *Lancet* Physical Activity Series Working Group. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet* 2012; published online July 18. [http://dx.doi.org/10.1016/S0140-6736\(12\)61031-9](http://dx.doi.org/10.1016/S0140-6736(12)61031-9).
- 3 WHO. Global Health Observatory Data Repository. 2011. <http://apps.who.int/ghodata> (accessed June 26, 2012).
- 4 WHO. Global health risks: mortality and burden of disease attributable to selected major risks. Geneva: World Health Organization, 2009.

## Physical activity: more of the same is not enough

Published Online  
 July 18, 2012  
[http://dx.doi.org/10.1016/S0140-6736\(12\)61027-7](http://dx.doi.org/10.1016/S0140-6736(12)61027-7)

For millennia, exercise has been recommended by physicians and scholars. For more than 60 years, science has shown that the health benefits of a physically active lifestyle are extensive and robust. In 1953, *The Lancet* published landmark papers by Jerry Morris and colleagues on the associations between physical activity at work and coronary heart disease.<sup>1,2</sup> Sedentary London Transport Authority bus drivers were at a higher risk of cardiac events than were their more active conductor peers. These publications laid the groundwork for physical activity epidemiology and stimulated the development of substantial research linking inactivity to increased risk of many non-communicable diseases.

We now know that physical inactivity is a significant predictor of cardiovascular disease, type 2 diabetes mellitus, obesity, some cancers, poor skeletal health, some aspects of mental health, and overall mortality, as

well as poor quality of life. Men and women of all ages, socioeconomic groups, and ethnicities are healthier if they achieve the public health recommendation of at least 150 min per week of moderate-intensity aerobic physical activity, such as brisk walking.<sup>3</sup> Immediate and future health benefits are also clearly described for children and adolescents, for whom at least 60 min per day of vigorous or moderate-intensity physical activity is recommended.<sup>4,5</sup> Muscular strengthening physical activities are also recommended for health improvement.<sup>3</sup>

In 2008, 63% of deaths worldwide were due to non-communicable diseases, mainly diseases of the heart and vascular system, diabetes mellitus, cancers, and obstructive pulmonary disease. Physical activity was recently considered a cornerstone for combating non-communicable diseases by the UN.<sup>6</sup> WHO recognises physical inactivity as one of the leading global risk factors for morbidity and premature mortality.<sup>7</sup> Further, physical inactivity directly affects many risk factors for morbidity and mortality including adiposity, raised blood glucose concentrations, high blood pressure, and a poor lipid profile. Furthermore, people benefit from even modest activity. Compared with inactive individuals, those who were active but at levels less than recommended (about 1.5 h per week), lived 3 years longer.<sup>8</sup>

Clearly, physical activity has vast potential to improve health throughout the world. As the scientific contributions of exercise science and public health have advanced our understanding of the health effects and consequences, the specialty of physical activity and public health has emerged. Public health practice



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is an action-oriented discipline that seeks to move populations towards health. After more than 60 years of scientific research, technological advancements that nudge us towards physical inactivity make it urgently necessary to take actions. Labour-saving devices such as motor vehicles and other transportation aids have had the unintended consequence of reducing the minimum daily energy expenditure necessary for living. This issue is of particular concern in countries with low-to-middle incomes undergoing substantial social and physical transitions. More of the same (in terms of research and practice) will not be enough. The global challenge is clear: make physical activity a public health priority throughout the world to improve health and reduce the burden of non-communicable diseases. However, to achieve such a goal, much work remains, as this *Lancet* Series emphasises.

With the upcoming 2012 Olympic Games, sport and physical activity will attract tremendous worldwide attention. Publication of this Series on physical activity and health at the same time as the Olympic Games is not a coincidence. Although the world will be watching elite athletes from many countries compete in sporting events requiring tremendous training, skill, and fitness, most spectators will be quite inactive. The popularity of the Olympic Games and elite sports such as professional soccer has not been, and will not be, translated into mass participation in exercise and physical activity that will improve the health of the world's population. Although the International Olympic Committee and the Olympic Movement have expressed concerns about rising inactivity in young people and recognised the importance of physical activity and sports for a healthy lifestyle,<sup>9,10</sup> physical inactivity continues to be a substantial concern needing public health action.

The global challenge of making physical activity a public health priority will not be easy to undertake, nor should it be taken lightly. Lessons can be learned from advances made in nutrition and tobacco control, but physical activity should be a separate and equal concern, and recognised as a unique specialty in public health. We trust this Series in *The Lancet* will initiate travel down that road.

It is especially important to address physical activity and non-communicable diseases in low-income and middle-income countries. Although more than 80% of the world's population lives in low-income and middle-income countries and more than 80% of the global burden

of non-communicable diseases lies here, only a small fraction of research on physical activity has been focused in these countries. The gap between where research is done and where public health problems are located is striking. Studies on the health benefits of physical activity, its correlates, and strategies for effective promotion are heavily concentrated in a few countries, most of which have stable or falling rates of non-communicable diseases. The largest increases and burden of non-communicable diseases are now seen in low-income countries, where our understanding of evidence-based strategies for increasing physical activity is poor. Altering this situation must be a priority in the next decade

\*Pedro C Hallal, Adrian E Bauman, Gregory W Heath, Harold W Kohl 3rd, I-Min Lee, Michael Pratt

Federal University of Pelotas, Pelotas 96030002, Brazil (PCH); Prevention Research Collaboration, School of Public Health, Sydney University, Sydney, NSW, Australia (AEB); University of Tennessee at Chattanooga and University of Tennessee College of Medicine, Chattanooga, TN, USA (GWH); University of Texas Health Science Center, Houston School of Public Health, and University of Texas at Austin Department of Kinesiology and Health Education, Austin, TX, USA (HWK); Division of Preventive Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA (I-ML); National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA (MP)  
prchallal@terra.com.br

We declare that we have no conflicts of interest. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the US Centers for Disease Control and Prevention.

- 1 Morris JN, Heady JA, Raffle PA, Roberts CG, Parks JW. Coronary heart-disease and physical activity of work. *Lancet* 1953; **262**: 1111–20.
- 2 Morris JN, Heady JA, Raffle PA, Roberts CG, Parks JW. Coronary heart-disease and physical activity of work. *Lancet* 1953; **262**: 1053–57.
- 3 Physical Activity Guidelines Advisory Committee. Physical Activity Guidelines Advisory Committee Report, 2008. Washington, DC: US Department of Health and Human Services, 2008.
- 4 Haskell WL, Lee IM, Pate RR, et al. Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Circulation* 2007; **116**: 1081–93.
- 5 WHO. Global recommendations on physical activity for health. Geneva: World Health Organization, 2011.
- 6 UN. 2011 High level meeting on prevention and control of non-communicable diseases. General Assembly. New York, NY: United Nations, 2011.
- 7 WHO. Physical inactivity: a global public health problem. Geneva: World Health Organization, 2011.
- 8 Wen CP, Wai JP, Tsai MK, et al. Minimum amount of physical activity for reduced mortality and extended life expectancy: a prospective cohort study. *Lancet* 2011; **378**: 1244–53.
- 9 International Olympic Committee. The 2006 Havana Sport for All Declaration. Havana: International Olympic Committee, 2006.
- 10 Mountjoy M, Andersen LB, Armstrong N, et al. International Olympic Committee consensus statement on the health and fitness of young people through physical activity and sport. *Br J Sports Med* 2011; **45**: 839–48.