

# Renewed Prescriptions For An Old Remedy: Physical Activity

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Policy makers struggle to act on a growing body of evidence that links better health to physical activity.

An article published in 2014 in the *British Journal of Sports Medicine* summed up the data succinctly: “Physical inactivity is a leading cause of death worldwide.”<sup>1(p1627)</sup> Indeed, US and international public health and medical experts have converged on that view in the past decade, thanks to a large body of compelling research. According to the World Health Organization (WHO), physical inactivity is responsible for 3.2 million deaths annually<sup>2</sup> and is the fourth-biggest risk for mortality, after high blood pressure, tobacco use, and elevated blood glucose.<sup>3</sup> Despite such a striking and heavy burden, policy makers have struggled to respond effectively, wrestling with the complex task of converting knowledge into interventions that can boost people’s activity levels, whether they’re working, engaging in domestic chores, or enjoying leisure time.

The goal: to stem the rising burden of noncommunicable diseases, such as diabetes, cardiovascular disease, and colon and breast cancer. A recent study in the *Lancet*, for example, found that global rates of diabetes increased by 45 percent between 1990 and 2013.<sup>4</sup> Addressing the consequences of inactivity is particularly challenging for low-to-middle-income countries, whose underresourced health sectors are still struggling to cope with major infectious diseases and now must also confront the rapidly growing costs of treating noncommunicable diseases. Eighty percent of deaths from noncommunicable diseases occur in low-to-middle-income countries.<sup>1</sup>

“There is an epidemic of noncommunicable diseases, and the need for prevention is huge,” says John Duperly, a doctor and sports physiologist at Universidad de los Andes, in Bogota, Colombia, and the South American regional director of Exercise is Medicine, an international program run by the American College of Sports Medicine that promotes physical activity as part of primary health care.

According to Duperly, the enormous medical advances of recent decades have made people complacent about the need for physical activity. “Over the last fifty years, we slowly forgot the importance of a healthy lifestyle because there is so much that can be done through medication and surgeries and other interventions,” he says.

## Physical Activity's Impact On Health

In 2008 the Department of Health and Human Services issued the US government's first set of "physical activity guidelines" for Americans, recommending that adults engage in 150 minutes a week of moderate aerobic activity or 75 minutes of vigorous activity.<sup>5</sup> Two years later the WHO adopted similar recommendations, noting that low-to-middle-income countries did not generally have their own physical activity guidelines.<sup>6</sup> A study published in *JAMA Internal Medicine* in April 2015 found that, compared to people who did not engage in leisure-time physical activity, those who engaged in some but less than the recommended amount had a 20 percent reduced risk of mortality, and those who engaged in one to two times the recommended amount had a 31 percent reduced risk.<sup>7</sup>

"Physical activity has the ability to prevent or manage chronic disease in a way that no pill or other intervention does," says physiologist Adrian Hutber, vice president of the Exercise is Medicine program. "If it could be put in a pill, it would be the most widely prescribed in the world."

Despite the evidence, the issue has not received the attention it deserves, say public health experts. "Unlike other NCD [noncommunicable disease] risk factors, such as tobacco, diet and alcohol, the importance of physical activity has been slow to be recognized, and the emphasis to tackle it at a population level has not been forthcoming," stated the *Lancet* in a 2012 comment that accompanied a series of articles on the topic.<sup>8</sup>

The *Lancet* comment also declared that simply advising individuals to exercise would not solve the problem, without an accompanying focus on removing structural barriers. "There has been far too little consideration of the social and physical environments that enable such activity to be taken," noted the comment. "Efforts beyond the health sector through social and environmental change will be necessary if we are to see greater uptake of this healthier behavior in people's lives."<sup>8</sup>

In measuring physical activity, researchers often break it down into the domains of occupation, transportation, domestic life, and leisure time. In recent decades, a number of factors—including a dramatic rise in the use of cars, computers, and cell phones—have led to reductions in physical activity in most or all of these domains, first in developed countries and then elsewhere. It has been estimated that almost a third of all adults worldwide are not physically active enough.<sup>9</sup>

Between the 1960s and the 2000s, physical activity levels in the United States and the United Kingdom fell by 32 percent and 20 percent, respectively, and are likely to experience further large drops by 2030, according to research<sup>10</sup> commissioned by Nike and cited in *Designed to Move*, an awareness campaign spearheaded by the company in a coalition with public health groups.<sup>11</sup> In low-to-middle-income countries, where the drop in activity levels has been steeper and more recent, rapid urbanization has played a major role, notes Shu Wen Ng, a health economist at the University of North Carolina at Chapel Hill, who coauthored the Nike-funded study.

In another study (not funded by Nike), Ng and colleagues examined the one-third drop in adult physical activity in China between 1991 and 2006 and found that factors related to urbanization—especially “community economic wellbeing, availability of educational institutions, improved sanitation and housing infrastructures”—were associated with 57 percent of the physical activity decline among men and 40 percent of the decline among women.<sup>12</sup> (The analysis included data from those ages 18–55 who were not disabled, pregnant, or lactating.)

The study noted that urbanization led to reduced physical activity largely through better living conditions, which allowed people to access basic goods and services with less movement and expenditure of energy. While these and other changes have increased leisure time for Chinese workers, workers’ rates of leisure-time physical activity have not compensated for the declines in other domains, the study found.

In both developed and developing countries, says Ng, technological advances in particular have reduced the need for physical activity, at home as well as at work.

“Something like mowing the lawn now would be very different from an intensity standpoint, compared to forty years ago,” she says. “With the technology, we don’t have to use very much force to push the lawnmower. So we’re spending less time doing domestic chores overall, and when doing domestic chores, we’re using much more technology to help us, so it’s less labor-intensive as well.”

In the past, according to Ng, people generally did not need to make a special point of engaging in physical activity, since it was an integral part of life. But that has changed. “Our environments are now such that for most people it seems like it is necessary to plan ahead to incorporate movement into your day, which takes up cognitive space and creates barriers,” she says.

### **A Growing Body Of Evidence**

The relationship between physical activity and good health has been recognized since at least the days of the ancient Greeks. “All parts of the body which have a function, if used in moderation and exercised in labors in which each is accustomed, become thereby healthy, well developed and age more slowly, but if unused they become liable to disease, defective in growth and age quickly,” stated Hippocrates (or someone whose work has been incorporated into the body of writings attributed to him).

Serious scientific study of the connection between physical activity and health began in the 1950s, with the seminal research of the Scottish epidemiologist Jeremy Morris. He and his colleagues examined the rates of coronary artery disease among tens of thousands of male public transportation workers, comparing drivers (who sat for most of their shifts) and conductors (who climbed up and down the steps of double-decker buses and other vehicles, collecting fares and dispensing tickets).<sup>13,14</sup>

Morris and his colleagues reported that the conductors experienced significantly lower rates of coronary artery disease, compared to the drivers. The cases of disease among the conductors were also less likely to be fatal and occurred at later ages than those among the drivers. The

researchers found similar results among postal workers: Those who cycled or walked while delivering mail had better outcomes than less physically active civil servants.

In the decades since, the body of evidence supporting the connection between physical activity and health has grown enormously. Physical activity has been linked to lower rates of cardiovascular disease, diabetes, cancer, depression, osteoporosis, and fall-related injuries, among other conditions, as well as improved immune function and other health indicators.<sup>5</sup>

In June 2015 the US National Institutes of Health (NIH) announced that it planned to spend \$170 million over five years on research into the molecular processes and mechanisms that mediate the effects of physical activity, including the impacts on specific tissues and organs. According to an NIH statement, the new research will generate “a molecular map of activity responses that will be made widely available to the scientific community, facilitating investigator-initiated studies and catalyzing the field of physical activity research.”<sup>15</sup>

Researchers have also investigated the associated economic costs of health problems arising from physical inactivity. A recent study from the Centers for Disease Control and Prevention (CDC) and Emory University compared health care expenditures for people who engaged in physical activity at recommended levels and those who did not.<sup>16</sup> (The study excluded people living in institutional settings, such as long-term care facilities and prisons.) After adjusting for body mass index, the researchers estimated that 11.1 percent of the health care expenses—close to \$120 billion annually—was associated with lack of adequate physical activity.

Then, to distinguish between people whose poor health prevented them from engaging in active pursuits and people whose lack of activity contributed to their health problems, the researchers repeated their analysis but excluded those who reported that a health issue caused them difficulty in walking. In that case, 8.7 percent of the health care expenditures were estimated to be related to physical inactivity.

Susan Carlson, the lead author and an epidemiologist with the CDC’s National Center for Chronic Disease Prevention and Health Promotion, says that some measures used in public health research, such as quality-adjusted life-years or disability-adjusted life-years, mean little to policy makers and the general public. According to her, calculating the economic costs associated with physical inactivity provides these important audiences with essential information.

“We can talk about the health benefits of the activity, but dollar units are easier to understand,” says Carlson. “This puts it in a more concrete sense and resonates with people.”

### **Translating Research Into Policy**

Although the benefits of physical activity are undisputed, a recent Cochrane Review of communitywide interventions to increase it—including public education and awareness campaigns—found little evidence that they worked.<sup>17</sup> A major obstacle is that cities have not generally been designed or constructed in ways that promote physical activity. Expanded public transportation networks, more parks and bicycle paths, better street lighting, and greater attention to the built environment would not only yield health benefits by encouraging walking

and other physical activities but would also improve a community's quality of life, say public health experts.

Meanwhile, health care systems interested in raising the profile of physical activity face their own challenges. Many physicians have little time to spend with each patient and therefore might focus on addressing immediate health problems instead of lifestyle choices. Even when physicians promote exercise to a patient, they might not know how to provide specific advice or what community resources might be available for support.

In seeking to increase the discussion of physical activity during clinical encounters, Kaiser Permanente has studied the impact of treating exercise as a vital sign. In April 2010 at some of the company's northern California facilities, medical assistants began asking patients at intake about their physical activity and exercise and recording the data in the electronic health record.

Compared to doctors in practices that did not implement this new intake step, doctors in practices that asked about and recorded the information were themselves more likely to add notes about patients' activity levels to the medical charts, the study concluded.<sup>18</sup> In addition, in the practices that raised the subject of physical activity at intake, patients were more likely to report that doctors counseled them about physical activity, overweight patients lost slightly more weight, and patients with diabetes showed better lab results, compared to patients in other practices. However, the average changes were modest.

"Systematically collecting exercise information during outpatient visits is associated with small but significant changes in exercise-related clinical processes and outcomes, and represents a valuable first step towards addressing the problem of inadequate physical activity," the study concluded.<sup>18(p341)</sup>

Yet experts recognize that the development and availability of community-based resources, not just provider interest, are critical aspects of promoting change. To help address that and other needs, in 2007 the American College of Sports Medicine and the American Medical Association launched the Exercise is Medicine program, subsequently coordinated by the sports medicine group, with the goal of having health care systems adopt physical activity as an integral part of their approach to the prevention and treatment of noncommunicable diseases.

In addition to supporting the adoption of physical activity as a vital sign in primary care, the Exercise is Medicine program recommends that physicians counsel patients about physical activity, offer them evidence-based "prescriptions" for activity appropriate to their situation, and inform them about community resources they might need. Recognizing that other countries face similar issues, the project has expanded beyond the United States. In 2013 Exercise is Medicine had a presence in thirty-nine countries, with regional centers in Australia, China, Colombia, Germany, Singapore, South Africa, and the United States.

"Broad implementation of PA [physical activity] counseling and referral systems, as [a] clinical practice standard of care, has the potential to improve PA at the population level," noted a 2014 article on Exercise is Medicine in the *British Journal of Sports Medicine*.<sup>1(p1627)</sup>

## A Global Challenge

Felipe Lobelo, the lead author of that 2014 article and a professor of global health at Emory University, became interested in the issue through his own experiences as a doctor in Colombia. When he realized that the health care infrastructure did not encourage patients to increase their levels of physical activity, he decided to pursue a career in research.

“For my patients with diabetes and cardiovascular disease, the health system focused on providing drugs, but not on the environmental factors that are the main drivers of these diseases,” says Lobelo, who is also the director of the Exercise is Medicine Global Research and Collaboration Center. “So I decided to try to study how do you integrate diet and exercise, how do you get the health care system to provide support for these lifestyle changes?”

Like many health professionals involved in the field, Lobelo understands from firsthand experience the role that physical activity can play in sustaining health. An avid soccer player since childhood, he is currently a midfielder (wearing jersey number 13) on the US Medical Soccer Team—a group of physicians that represents the United States in the annual World Medical Football Championships.

“If you’re not active yourself, you’ll be much less likely to provide this kind of counseling to your patients,” says Lobelo. “I’ve been lucky to be able to be active throughout my life, and that has shaped my personal and research interests.”

The early stage of the Exercise is Medicine program focused mainly on building awareness, support, and an institutional infrastructure in the participating countries. The program has entered the implementation phase, which involves training physicians about the importance of the issue, developing evidence-based “prescription” strategies for a range of physical conditions, cataloguing and expanding networks of physical activity resources, and creating strong linkages between the clinical and community settings.

Notwithstanding the enormous challenges, Duperly, the South American regional director of the program, says that he is encouraged because many colleagues now recognize the importance of the issue, in contrast to his early days of medical practice. “This topic has gotten the attention of newer generations of health professionals,” he says.

## NOTES

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