

## Editorial

# The Burgeoning Roots of Socioeconomic Inequalities in Health: The Legacy Effect



## El rápido crecimiento de las desigualdades socioeconómicas en salud: el efecto del legado

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### Article history:

Available online 5 October 2016

A large and growing body of evidence suggests that there are systematic differences in health between distinct socioeconomic groups. Even in nations with a high standard of living, people with lower socioeconomic status (SES) have substantially shorter life expectancies and more disease than those with higher SES.<sup>1</sup> Not only do these differences represent a social injustice, they have led to a growing understanding of the vulnerability of health to the social environment, known as social determinants of health.

In the article published in *Revista Española de Cardiología*, Pérez-Hernández et al.<sup>2</sup> expand on existing knowledge of the pronounced social inequalities in cardiovascular risk-factors (CVRF). In particular, they demonstrate that in older Spanish adults, education, occupation, and paternal occupation are strongly associated with lifestyle factors such as smoking, alcohol intake, and diet, as well as biological factors such as weight, blood pressure, and diagnosis of cardiovascular disease (CVD). These findings show that not only are there significant inequalities in CVRFs in older adults in Spain, but also that the legacy effect of parents seem to manifest in SES-gradients later in life among their offspring.

There are a number of strengths in the study by Pérez-Hernández et al. To examine socioeconomic inequalities in CVRF, data are used from a nationally representative sample with multiple measures of SES. The study also includes a broader set of CVRFs than most previous studies. The limitations of this work include the use of the SCORE equation for CVD risk estimation, which precludes factors strongly associated with SES such as physical activity, a sedentary lifestyle, and obesity. In addition, telephone questionnaires used to assess SES and morbidity have been shown to overrepresent people with higher education.<sup>3</sup> Self-reported data are also prone to misreporting (eg, recall bias, social durability), which may be associated with SES.<sup>4</sup> Lastly, as with many other published social epidemiological studies, unmeasured

confounders and SES misclassification issues may have undermined the validity of the findings.

Nonetheless, the study by Pérez-Hernández et al. highlights the ubiquitous relationship between SES and health outcomes. The impact of income, education, and employment opportunities on health outcomes may be longitudinal and cumulative in nature. The life-course perspective recognizes the important role played by early and later life exposures in adult health. Available evidence has shown a strong association between *in utero*/early infancy exposures and adult outcomes, demonstrating that the seeds of longitudinal health inequality begin well before any manifestation of disease.<sup>5</sup> Disadvantages tend to concentrate among the same people and their effects on health culminate as they age, suggesting that these roots and stems of socioeconomic inequality sprout throughout life from multiple exposures because both individual SES and neighborhood SES are independently and significantly associated with the incidence of CVD and mortality.<sup>6–8</sup>

The intermediary causal-pathway mechanisms by which SES leads to poorer health outcomes, however, remain complex. Socioeconomically-disadvantaged populations have been shown to adhere to less healthy lifestyles (eg, higher rates of smoking, poorer dietary intake), which in turn help account for the higher prevalence of obesity, diabetes, hyperlipidemia, hypertension, and CVD among lower socioeconomic subgroups.<sup>9</sup> Parental SES, as well as childhood and early psychosocial stressors have been shown to intensify the association between low SES and CVD risk.<sup>10</sup> Financial affordability may impede access to necessary medical services particularly in countries without universal health coverage, which may further erode cardiovascular and noncardiovascular health.<sup>11</sup> Communities may also play an important role in mediating the SES-health gradient, as evidenced by studies demonstrating independent associations between neighborhood SES and outcomes even after adjustment for individual-level SES. Such multilevel factors may result in “double-jeopardy” health effects, particularly for those individuals with lower incomes who also reside in lower SES communities.<sup>6</sup>

SES has also been shown to have prognostic associations with outcomes even after the onset of CVD, suggesting that SES-health outcome gradients persist throughout life beyond incident sentinel

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<http://dx.doi.org/10.1016/j.rec.2016.05.010>, *Rev Esp Cardiol.* 2017;70:145–154.

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<http://dx.doi.org/10.1016/j.rec.2016.08.006>

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acute myocardial infarction (AMI) events. For example, in 1 study, patients residing in low SES neighborhoods were 25% more likely to die after an AMI even after adjustment for CVRF and treatments received.<sup>7</sup> Residual differences in post-AMI outcomes between higher and lower SES subgroups are likely mediated in part by differences in health-seeking behaviors and self-directed care. Our team has previously demonstrated that long-term post-AMI socioeconomic mortality gradients were explained by differences in functional capacity recovery during the first year after an AMI.<sup>12</sup> A corollary to these findings also suggests that mediators of SES-outcome gradients may not be static, but rather differ in importance over time. In summary, the explanatory pathways mediating SES-outcome gradients are multifactorial and multidimensional over time and space.

Given such complexity, how then can socioeconomic-health outcome disparities be narrowed? On the surface, one might logically hypothesize that SES interventions should focus on preventative strategies that combine person- and societal-centered approaches that integrate health/disease management with social policies aimed at improving income, education, and employment opportunities for all.<sup>6</sup> Such multipronged approaches would need to intercede from the primordial stages of the life course through to end-of-life, but would assume that investment in the early years provides one of the greatest potentials to reduce SES-health inequalities. At the individual level, interventions can be geared toward delivering individualized care to achieve lifestyle modifications and psychosocial support. At the community level, health promotional activities can encourage participation in healthy lifestyle activities, while at the government level, tax reform policies can serve to incentivize their longer-term adherence.<sup>11</sup>

Notwithstanding their conceptual advantages, the implementation of integrative multilevel and multidimensional SES interventions lack feasibility and remain largely untested. To date, most SES-based interventions have been limited in size, scope, and follow-up. Not surprisingly, the results have been mixed and largely disappointing. While intensive lifestyle interventions do appear to be efficacious among lower socioeconomic subgroups,<sup>13</sup> therapeutic responsiveness may not be as high as for those who are more socioeconomically advantaged.<sup>14</sup> Likewise, in evidence-based secondary prevention lifestyle programs such as cardiac rehabilitation, at least 1 study has demonstrated fewer absolute survival benefits among socioeconomically-disadvantaged than advantaged subpopulations, even though the former had inherently higher baseline risks.<sup>15</sup> Such differences in effectiveness were largely attributable to higher rates of programmatic attrition and drop-out among patients in lower socioeconomic subgroups.

Although improvements in economic prosperity, public health, and health care have reduced morbidity and markedly improved life expectancy over the past century, an increasing number of studies have demonstrated the importance of individual and neighborhood SES on disease development, progression, and prognosis. The social pattern of disease is universal, though its magnitude and extent vary. Pérez-Hernandez et al. remind us that the health and wellbeing of individuals are shaped by circumstances that arise and persist throughout the life course. Accordingly, the burgeoning effects of SES may necessitate interventions at various time points throughout life. Focusing

future efforts on the design, evaluation, and implementation of more comprehensive multidimensional SES interventions will require innovation, time, and resources. Such interventions will always remain challenging. Nevertheless, there are few goals more laudable than those geared toward the reduction or amelioration of social-health disparities, even if they may require time to achieve.

## ACKNOWLEDGEMENTS

D.A. Alter is a Career Investigator with the Heart and Stroke Foundation of Ontario and holds a Research Chair in Cardiac and Metabolic Rehabilitation, University Health Network-Toronto Rehabilitation Institute.

## CONFLICTS OF INTEREST

None declared.

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