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Editorial

Targeting social disadvantage to prevent early development of heart failure

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> *Medicine is a social science and politics is nothing else but medicine on a large scale. Doctors are the natural attorneys of the poor.*
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> [Rudolf Virchow [1]]

In 1848, Rudolf Virchow, one of the fathers of contemporary pathology, conducted an investigation into the causes of a typhus epidemic in Upper Silesia. He identified the direct cause of the epidemic in the famine of previous years, and outlined that poor peasants were those most severely affected by both the famine and the epidemic. According to Virchow, elimination of social inequality was the only way to prevent further epidemics [1].

The notion that social disadvantage is a determinant of disease and that social issues must be addressed to improve population health retain their validity in the present era, when chronic disorders have become the main determinants of morbidity and mortality. Indeed, almost every chronic disease, including heart failure (HF), follows a predictable pattern of rising prevalence with declining income [2]. The relevance of socio-economic issues is particularly evident in the United States, where widening economic inequality has been accompanied by increasing disparities in health outcomes, and the life expectancy of the wealthiest Americans now exceeds that of the poorest by 10–15 years [3]. Poor Americans have low rates of adequate health insurance; for this reason, many patients do not seek medical assistance, and cannot afford the care they need, or may be bankrupted by medical bills [3]. Additionally, non-White individuals have a higher risk of lack of health insurance, poverty, while they recognize, too, an increased prevalence of smoking and obesity. Racial disparities in health have been well documented, and disparities in several health status indicators (including mortality for heart disease) between non-Hispanic (NH) Black and NH White seem to widen over time [4]. To cite a few mechanisms of this disparity, primary-care providers and specialists are not attracted to predominantly black neighborhoods, and health-promoting resources are inadequately invested into these areas, which end up by having lower-quality health-care infrastructure and services facilities, as well as fewer and less qualified clinicians. This inequitable system is likely to disproportionately expose black residents to racially-biased services, resulting in worse health outcomes [5].

In this issue of the *Journal*, Ditah and Colleagues analyze the predictors of earlier age of HF diagnosis, which they propose as another possible health indicator [6]. The Authors analyzed data from 50,588 non-hospitalized individuals participating to the US National Health and Nutrition Examination Survey (NHANES) registry from 2007 to 2016. The prevalence of HF was 2.44% with a median age at diagnosis of 59 years. NH Blacks (11% of the population), individuals living below the poverty line (18%), obese persons (37%), subjects without health insurance (18%), and those without hypertension (68%) were diagnosed with HF at statistically significant younger ages. Specifically, NH Blacks were diagnosed on average 5 years before NH Whites, those living below the poverty line or obese were diagnosed 6 years and 5 years before, respectively; those without health insurance and never diagnosed with hypertension were diagnosed on average 4 years before. By contrast, widowed individuals were diagnosed on average 10 years later than married individuals [6].

As observed by the Authors, the association between absence of hypertension and early diagnosis of HF is probably confounded by age, as hypertension is very rare among young individuals. The opposite goes for widowed individuals, who tend to be older than subjects in all other marital categories. In addition to the problematic link between association and cause-effect relationship, another possible limitation of this study is its inability to provide insight on what comes before (e.g. possible delays in diagnosis) or after the diagnosis of HF (e.g. therapy and events). On the other hand, the likelihood of a timely diagnosis of HF seems low in poor patients, without a health insurance; therefore,

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disadvantaged individuals could develop HF even earlier than reported above. Poor control of cardiovascular risk factors (obesity), unhealthy diet and behavior (smoking and drinking habits), lower physical activity, higher rates of childhood obesity, and also higher levels of stress and worse mental health [7] could contribute to the HF development at a younger age, either directly or through accelerated progression of coronary atherosclerosis and earlier occurrence of acute coronary syndromes. With regards to HF management, we may conclude that poor people have a less likelihood of receiving state-of-the-art therapies (particularly, costly options like device therapies or heart transplantation), are less compliant to prescribed therapies, and are followed-up more loosely. We are not aware of any systematic, rigorous assessment of the prognostic impact of social disadvantage on HF prognosis, but survival is likely to decrease in parallel with social status and worsening living conditions. This conclusion is indirectly supported by a recent sub-analysis of the PARADIGM-HF (Prospective comparison of ARNI [Angiotensin Receptor Neprilysin Inhibitor] with ACEI [Angiotensin-Converting Enzyme Inhibitor] to Determine Impact on Global Mortality and morbidity in Heart Failure) and the ATMOSPHERE (Aliskiren Trial to Minimize OutcomeS in Patients with Heart Failure) trials, showing that countries with greater income inequality are also those with the highest mortality after adjustments for recognized, patient-level prognostic variables and per capita income, and despite the lowest prevalence of all recorded comorbid conditions (hypertension, diabetes, atrial fibrillation, stroke, chronic obstructive pulmonary disease, and kidney disease) [8]. Interestingly, countries with the greatest social inequality were also those with the lowest age at HF diagnosis, were the inexpensive digoxin was most often used, and expensive devices much less [8].

While we are waiting for further studies elucidating the impact of social inequality on HF development, treatment, and outcome, we may propose that Virchow's brilliant intuition that medicine needs politics to improve population health may be applied also to the HF setting. Indeed, social interventions to reduce inequalities, promotion of a healthy lifestyle, defend the universal healthcare system from increasing privatization of health and support its diffusion where, as in the US, is less present seem much more likely to reduce the burden of HF than any drug or device therapy for this condition, at least for the economically disadvantaged classes.

Declaration of Competing of Interest

The authors report no relationships that could be construed as a conflict of interest.

References

[1] J.P. Mackenbach, Politics is nothing but medicine at a larger scale: reflections on public health's biggest idea, J. Epidemiol. Community Health 63 (2009) 181–184.

[2] www.urban.org/research/publication/how-are-income-and-wealth-linkedhealth-and-longevity.

[3] S.L. Dickman, D.U. Himmelstein, S. Woolhandler, Inequality and the health-care system in the USA, Lancet 389 (2017) 1431–1441.

[4] J.M. Orsi, H. Margellos-Anast, S. Whitman, Black-White health disparities in the United States and Chicago: a 15-year progress analysis, Am. J. Public Health 100 (2010) 349–356.

[5] Z.D. Bailey, N. Krieger, M. Agénor, J. Graves, N. Linos, M.T. Bassett, Structural racism and health inequities in the USA: evidence and interventions, Lancet 389 (2017) 1453–1463.

[6] C.M. Ditah, R. Ebad, V.N. Agbor, et al., Disparities and drivers of early age at diagnosis of congestive heart failure in the USA, Int. J. Cardiol. 293 (2019) 143–147.

[7] https://docs.google.com/viewerng/viewer?url=https://community-wealth.org/sites/clone.community-wealth.org/files/downloads/paper-woolf-et-al.pdf.

[8] P. Dewan, R. Rørth, P.S. Jhund, et al., Income inequality and outcomes in heart failure, JACC Heart Fail. 7 (2019) 336–346.