

Contents lists available at [ScienceDirect](#)

IJC Heart & Vasculature

journal homepage: www.journals.elsevier.com/ijc-heart-and-vasculature

From calculating cardiovascular risk factors in Honduras towards a universal cardiovascular risk model



Cardiovascular disease (CVD) is the most important cause of death worldwide and recent registries suggest increasing trends in CVD mortality. This increased prevalence of CVD is not confined to high-income countries in the Western world but is currently also observed in many low- and mid-income countries [1]. However, just limited data from Central American countries is available. Further, many low- and mid-income countries are undergoing epidemiological transitions with gradual adoption of Western lifestyle leading to development of new cardiovascular risk factors such as hypertension, dyslipidaemia, diabetes and obesity [2,3]. The knowledge about local epidemiology and the exact evaluation of present potentially modifiable risk factors is important to gain awareness in the population for risk factors and risk stratification as well as to guide the decision-making process in education, public health campaigns and decisions in health care. Current international guidelines recommend risk assessment tools to predict CVD risk and outcomes to guide primary and secondary prevention programs [4]. However, these tools have been validated in predominantly Western populations and their value to predict risk in Central American populations is unclear. Increasing data about CVD prevalence and risk factor burden in low- and mid-income countries aid in the development of universal risk prediction tools and improvement of these tools in the future.

It is in this context that the work by Sanchez et al. [5] in this issue of the Journal on the prevalence of traditional risk factors of CVD in a community from Honduras is welcomed. Their study was performed in Copan, a department with almost 400,000 inhabitants in Western Honduras; a country with only 3 physicians per 10,000 inhabitants. Volunteers between 45 and 75 years of age without a history of CVD were recruited for this study in local medical institutions. By means of a questionnaire the medical history, family history, use of tobacco, use of medications, and self-reported exercise was assessed. In addition, body mass index, blood pressure, glucose, and cholesterol profile were measured. The 382 volunteers in this study were predominately women (62%), around 60 years of age, and all but one were of Hispanic/Latino descent. Only 3% of the women in this study reported to smoke, a low percentage compared to historic data about smoking in Honduras [6]. Overall, pharmacological treatment of known risk factors was quite good. Volunteers with a self-reported diagnosis of hypertension and diabetes were on medication in 91% and 96%, respectively, but many turned out to have undiagnosed hypertension (42%) or

(pre)diabetes (6.7%). Only 23% of participants with increased cholesterol were on lipid lowering medication. After collecting all the traditional cardiovascular risk factors, the authors applied four different cardiovascular risk scores in this population. The resulting risk scores appear alarming high to us as 71% of all the males and 17% of all the females had a Multi-Ethnic Study of Atherosclerosis (MESA) score of more than 7.5%.

These results provide us insights in the cardiovascular risk factors profile and burden in Honduras, albeit from a small number of individuals that may not be representative of the general population. A good infrastructure, data-network and collaboration between committed stakeholders will be key for future larger more representative cohort studies and for a successful follow-up to better determine the correlation between prevalent risk factors and resulting cardiovascular outcomes. These data will be crucial to decide whether it is appropriate to use the existing cardiovascular risk assessment tools in this Central American populations.

This community-based cross-sectional study is the first to describe the high prevalence of cardiovascular risk factors in Honduras. Therefore, by the lack of tailored programmes, it is plausible that the higher than expected CVD prevalence likely resulted from poorly managed or untreated risk factors. Indeed, low knowledge level and awareness towards CVD risk is known to be associated with low literacy level and rural residency in Central America, consistent with the Honduran population in this study. Further epidemiological data is urgently needed to fill in the data gap on prevalent cardiovascular risk factors in Honduras including its impact on mortality and cardiovascular outcomes.

General principals in preventing CVD such as promoting a healthy diet, regular exercise and cessation of smoking are straightforward but often difficult to achieve. There is considerable uncertainty about the best ways of helping people at high CVD risk to modify their behaviour. Support by global, national and local governments and organizations is required to develop policy and implement tailored programmes. Simple solutions such as triggering healthy diet choices on schools and broad education can be effective and of low cost [7].

This study by Sanchez et al have shown us how many people have untreated hypertension, diabetes and dyslipidaemia. Approximately 17% of Hondurans do not have regular access to health services [5]. Therefore, alternative risk factor screening and management programs will be required to better control risk factors and reduce cardiovascular risk in low- and mid-income countries. One example may be programs comparable to the one recently

DOI of original article: <https://doi.org/10.1016/j.ijcha.2020.100476>

<https://doi.org/10.1016/j.ijcha.2020.100485>

2352-9067/© 2020 The Authors. Published by Elsevier B.V.

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

described and tested in the A Cluster-Randomized Trial of Blood-Pressure Reduction in Black Barbershops. Among black male barber-shop patrons with uncontrolled hypertension, health promotion by barbers resulted in larger blood-pressure reduction when coupled with medication management in barbershops by specialty-trained pharmacists [8]. Additionally, organization and management of care via digital solutions, medical care might become more accessible in the rural areas of Central America [9]. Another example of increasing accessibility of healthcare in Latin America has been presented earlier in this Journal [10,11].

However, the best approach for community-based interventions to control non-communicable risk factors remains unclear. Data such as these presented by Sanchez et al. provide useful information for developing targeted interventions or public health policy to curtail the growing epidemic of CVD. We hope that this epidemiologic study is the start of an effective program for the prevention of CVD. By giving this study a platform we hope to inspire this research group to continue their work and we are looking forward to the long term results.

References

- [1] World Health Organisation, World Health Organisation. Chapter 1: Burden: mortality, morbidity and risk factors. Global status report on noncommunicable diseases, 2011.
- [2] D. Linz, P. Sanders, B. Pitman, D. Dobrev, D.H. Lau, Atrial fibrillation in sub-Saharan Africa: the knowns and unknowns?, *Int. J. Cardiol. Heart Vasc.* 22 (2019) 212–213.
- [3] E. Tegene, I. Tadesse, Y. Markos, T. Gobena, Prevalence and risk factors for atrial fibrillation and its anticoagulant requirement in adults aged ≥ 40 in Jimma Town, Southwest Ethiopia: a community based cross-sectional study, *Int. J. Cardiol. Heart Vasc.* 22 (2019) 199–204.
- [4] Rossello X, Dorresteijn JA, Janssen A, Lambrinou E, Scherrenberg M, Bonnefoy-Cudraz E, Cobain M, Piepoli MF, Visseren FL, Dendale P, This Paper Is A Co-Publication Between European Journal Of Preventive Cardiology European Heart Journal Acute Cardiovascular Care And European Journal Of Cardiovascular Nursing. Risk prediction tools in cardiovascular disease prevention: A report from the ESC Prevention of CVD Programme led by the European Association of Preventive Cardiology (EAPC) in collaboration with the Acute Cardiovascular Care Association (ACCA) and the Association of Cardiovascular Nursing and Allied Professions (ACNAP). *Eur J Prev Cardiol.* 2019;26:15341544.
- [5] Cardiovascular risk assessment in the resource limited setting of Western Honduras: An epidemiological perspective. Sanchez et al. *Int. J. Cardiol. Heart Vasc.* 27 (2020) 100476.
- [6] F. Moller, Wehbe, Smoking and smoking cessation in Latin America: a review of the current situation and available treatments, *Int. J. Chron. Obstruct. Pulmon. Dis.* 3 (2008) 285–293.
- [7] T.M. Marteau, D. Ogilvie, M. Roland, M. Suhrcke, M.P. Kelly, Judging nudging: can nudging improve population health?, *BMJ* 342 (2011) d228.
- [8] R.G. Victor, K. Lynch, N. Li, C. Blyler, E. Muhammad, J. Handler, J. Brettler, M. Rashid, B. Hsu, D. Foxx-Drew, N. Moy, A.E. Reid, R.M. Elashoff, A cluster-randomized trial of blood-pressure reduction in black barbershops, *N Engl. J. Med.* 378 (2018) 1291–1301.
- [9] M. Steinmetz, C. Rammos, T. Rassaf, J. Lortz, Digital interventions in the treatment of cardiovascular risk factors and atherosclerotic vascular disease, *Int. J. Cardiol. Heart Vasc.* 26 (2020) 100470.
- [10] R.A. Montañez-Valverde, L.A. More, P. Mendoza-Novoa, First catheter ablations in the ministry of health system of Peru: Report of the initial experience, *Int. J. Cardiol. Heart Vasc.* 24 (2019) 100402.
- [11] T.A.R. Lankveld, K. Vernooij, H.J.G.M. Crijns, D. Linz, How to make catheter ablation available world-wide?, *Int. J. Cardiol. Heart Vasc.* 24 (2019) 100411.

Bart Scheenstra ^{a,*}

Arnoud van 't Hof ^{a,b,c}

Marieke Spreeuwenberg ^d

Dominik Linz ^{a,c,e,f}

^a Department of Cardiology, Maastricht University Medical Centre, Maastricht, the Netherlands

^b Department of Cardiology, Zuyderland Medical Centre, Heerlen, the Netherlands

^c Cardiovascular Research Institute Maastricht, Maastricht, the Netherlands

^d Department of Health Services Research, CAPHRI, Maastricht University, Maastricht, the Netherlands

^e Department of Cardiology, Radboud University Medical Centre, Nijmegen, the Netherlands

^f Centre for Heart Rhythm Disorders, University of Adelaide and Royal Adelaide Hospital, Adelaide, Australia

* Corresponding author at: Maastricht UMC+, Maastricht Heart +Vascular Center, 6202 AZ Maastricht, the Netherlands.
E-mail address: Bart.Scheenstra@mumc.nl (B. Scheenstra)

Received 14 February 2020

Accepted 16 February 2020

Available online 25 February 2020