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Sleep disorders in low- and middle-income countries: a call for action

Response to Zeng L, Chen R, Hu L, et al. Concern about sleep disorders in underresourced settings is imminent. *J Clin Sleep Med*. 2021;17(XX):XXX–XXX. doi:10.5664/jcsm.9590

Johanna Roche, PhD^{1,2}; Dale E. Rae, PhD³; Kirsten N. Redman, MSc¹; Kristen L. Knutson, PhD⁴; Malcolm von Schantz, PhD^{1,5}; F. Xavier Gómez-Olivé, MD, PhD⁶; Karine Scheuermaier, MD¹

¹*Wits Sleep Laboratory, Brain Function Research Group, School of Physiology, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa*

²*Institute of Mountain Emergency Medicine, Eurac Research, Bolzano, Italy*

³*Division of Physiological Sciences & Health through Physical Activity, Lifestyle and Sport Research Centre, Department of Human Biology, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa*

⁴*Feinberg School of Medicine, Northwestern University, Chicago, IL*

⁵*Department of Psychology, Northumbria University, Newcastle-upon-Tyne, United Kingdom*

⁶*MRC/Wits Rural Public Health and Health Transitions Research Unit (Agincourt), School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa*

Address correspondence to: Johanna Roche, Institute of Mountain Emergency Medicine, Eurac Research Via Ipazia 2, 39000 Bolzano, Italy; Email: johanna.roche@eurac.edu

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We are grateful to Zeng et al for their response¹ to our recent paper², where we used portable polysomnography in the homes of randomly sampled older adults at the Agincourt Health and Demographic Surveillance System site in rural northeast South Africa. In this increasingly hypertensive and overweight/obese population, we observed an obstructive sleep apnea (OSA) prevalence of 29.3%. Importantly, apnea-hypopnea index (AHI) severity and being a woman were independently associated with a greater cardiometabolic risk score. In their letter¹, Zeng *et al* drew attention to the fact that since ± 4.5 billion people globally live in rural communities, the potential for undiagnosed and untreated sleep disorders across the developing world is huge. In fact, an earlier study of 43,935 persons across eight African and Asian rural communities found a 16.6% overall prevalence (ranging from 4% to 40%) of severe problems falling or staying asleep³.

Target 3.4 of the UN sustainable development goals (SDGs) aims to reduce mortality from non-communicable diseases (NCDs) by one-third by 2030 through prevention and treatment⁴. Primary measures addressing this target, such as pharmacological and behavioral treatments of hypertension and diabetes, are being widely implemented across the world. As our study and Zeng et al's response highlight, there is a need beyond this to address issues such as OSA, which are more complex to diagnose and treat, but nonetheless prevalent and important in combating NCDs.

Our knowledge about the prevalence and natural history of OSA and other sleep disorders in low- and middle-income countries (LMIC) is still insufficient. We agree with Zeng et al that our findings require replication at a larger scale and across LMICs, capturing differences in cultural and genetic

backgrounds. Our results provide important proof of concept for the utility of portable polysomnography in order to study the prevalence of and clinically diagnose OSA in under-resourced settings. This is important not only for addressing cardiometabolic morbidity and mortality, but also the growing health inequality both between social groups and between men and women stemming from untreated OSA, as the daytime effects of OSA affect the ability of patients to function during the daytime and to make a living⁵.

Beyond the issue of diagnosis, there is a paucity of treatment options for OSA in LMICs. In addition to the worldwide need to develop novel specific pharmacological interventions against OSA, there is a need to make CPAP therapy, the current gold-standard treatment, available in and feasible for populations in developing countries, especially in rural areas where electricity supply is expensive and unreliable. This presents a technological challenge for developing and mass-producing affordable CPAP equipment that is resilient to power supply interruptions, or even usable in homes without electricity. Once realistic treatment options are available, there will be a need to complement education about controlling cardiometabolic risk through a healthier lifestyle with specific education about the causes, symptoms, and risks associated with OSA. All of this represents an increasingly urgent world-wide research agenda.

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