

# International patterns of prevalence of low eGFR in adults aged 18-60 without traditional risk factors, from population-based cross-sectional studies

## The Disadvantaged Populations eGFR Epidemiology Study (DEGREE)

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- Includes 19 studies with sample sizes ranging from 301 to 8916.

- High prevalence was generally only observed in rural men than women. Highest in Andhra Pradesh, India (13.7%) and Northwest Nicaragua (13.6%).

- Prevalence in rural men was low (<2%) outside of Central America and South Asia.

### BACKGROUND

Globally, chronic kidney disease (CKD) is associated with diabetes, cardiovascular diseases and congenital abnormalities etc. However, CKD of unknown cause (CKDu), which affects working-age populations in low-and-middle-income countries (LMICs), is increasingly recognised due to early diagnosis difficulties and unknown global burden.

Reports from Central America, Mexico, India, and Sri Lanka suggest CKDu is most common in male agricultural workers, but the epidemiology is debated, and no specific causes have been confirmed.

The study aims to estimate the prevalence of impaired renal function, using estimated glomerular filtration rate (eGFR), in disadvantaged communities globally.

### METHODS

The DEGREE study was designed to gain insight into the burden of CKDu using standard protocols.

We estimated the prevalence of eGFR<60mL/min/1.73m<sup>2</sup> by excluding participants with high ACR (albumin-to-creatinine ratio)>300mg/g, self-reported or measured hypertension or diabetes, in population-representative surveys of working-age adults, stratified by sex and rural-urban classification. Age-standardised prevalence was calculated using the following equation  $\sum_{i=1}^5 ASP_i * w_i$  as weighted average of age band-specific rates according to the WHO world population.

eGFR was mainly calculated using the creatinine-based CKD-EPI 2009 equation without race adjustment. Studies varied in size from focused surveys of specific communities to regional or national surveillance projects.

### RESULTS

There were 60964 participants from 19 studies and 43 areas across 14 countries. Studies ranged from focused surveys of specific communities to large regional or national surveillance projects (2007-2023). The proportion of men in each sample varied from 24-53% (median = 43%). Overall, higher prevalence was observed in rural men than women (Figure 1 and 2).

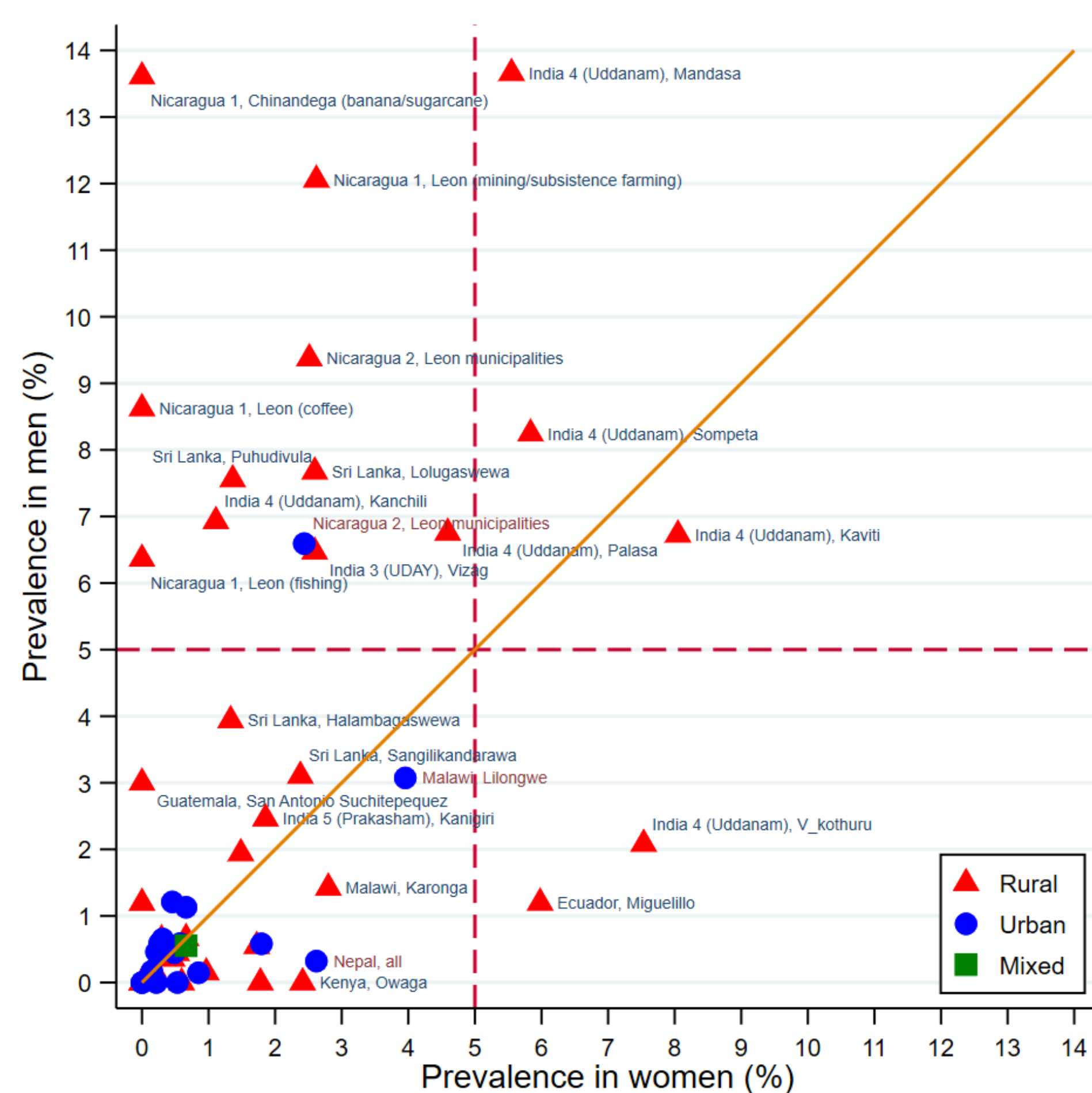


Figure 1: Age-standardised prevalence of eGFR<60 by sex in populations without hypertension, diabetes mellitus or heavy proteinuria

### RESULTS CONTINUED

Prevalence was highest in Andhra Pradesh, India (up to 13.7% [4.8%, 22.6%]) and Northwest Nicaragua (up to 13.6% [6.3%, 20.9%]). Of the areas considered, prevalence in rural men was low (<2) outside of Central America and South Asia, including areas of Kenya, Italy, Malawi, Peru, Chile, Ecuador, Thailand, England, and the USA (Figure 2).

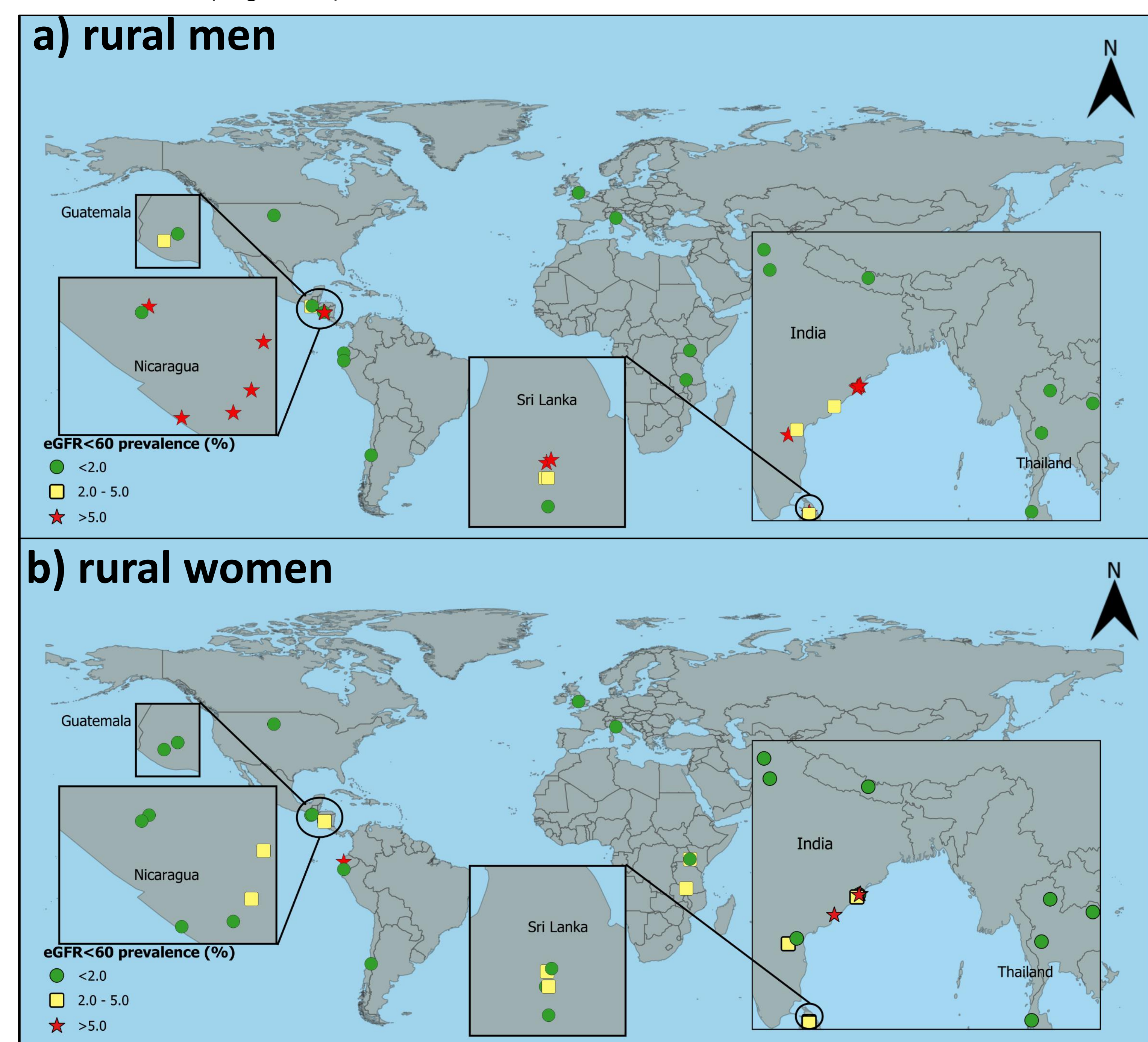


Figure 2: Age-standardised prevalence of creatinine-based eGFR<60 in a) rural<sup>a</sup> men and b) rural<sup>a</sup> women, aged 18-60 without hypertension, diabetes, or heavy proteinuria  
<sup>a</sup>USA includes rural and urban together; eGFR=estimated glomerular filtration rate in ml/min/1.73m<sup>2</sup>

### CONCLUSIONS

- These observations represent the first attempts to quantify the burden of CKDu around the world (using low eGFR without traditional risk factors as a proxy).
- These findings have limitations in terms of lack of individual-level exposure assessment, variations in eGFR equations across populations, potential misclassification due to our pragmatic CKDu definition and absent data.
- It is not yet clear what drives the differences between countries, but available evidence to date supports a high general-population burden of CKDu in multiple areas within Central America and South Asia, although clusters of disease may also exist elsewhere.

### ADDITIONAL KEY INFORMATION

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