

Group Title: Urban-rural differences in diabetes-associated mortality in China

In Reply:

The China Kadoorie Biobank (CKB) was not designed to be nationally representative, and the 10 study areas were selected from different provinces to capture the diversity of populations in China. Diabetes prevalence in the CKB (5.9%) was lower than in some more recent studies,^{1,2} possibly reflecting increasing temporal trends in diabetes prevalence in China and also the different methods used for diagnosing diabetes in different studies. The prevalence of previously diagnosed diabetes (3.1%) in the CKB is comparable with nationally representative surveys conducted in the same decade (3.5%²). For screen-detected diabetes, we relied mainly on measurement of random plasma glucose levels, supplemented by fasting data; this approach likely failed to identify some cases of diabetes that would have been detected by measurement of additional glycemic indicators (fasting plasma glucose, post-load glucose, HbA1c) used in more recent studies.^{1,2}

Drs Wang and Lai argue that urban and rural populations should be derived from the same regions to assess more reliably urban and rural differences in diabetes-associated risks. While this approach may be preferred, the key requirement for comparability is to ensure that the results are not affected by differences in demographics and socioeconomic status (e.g. sex, age, education), lifestyle factors (e.g. smoking, alcohol drinking, physical activities) and physical characteristics (e.g. blood pressure, adiposity) across different areas. This was done in our study. Moreover, analyses—including comparisons between urban and rural areas overall—were also adjusted for individual study area, which would take into account any influence of study area-level characteristics, such as those described by Wang and Lai. Furthermore, the observed urban-rural differences in diabetes-associated mortality risks were limited mainly to a few specific disease outcomes, most notably acute diabetic crises (diabetic ketoacidosis or coma) and chronic kidney disease, and the differences for these diseases are substantial enough (e.g. 3-4 fold difference in relative risk) that they are unlikely to be accounted for by

residual confounding. The urban-rural differences in risk observed in our study are probably chiefly attributable to well-documented differences in health care provision between urban and rural areas, both nationally and within the same province.

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2. Xu Y, Wang L, He J, et al. Prevalence and control of diabetes in Chinese adults. *JAMA*. 2013;310:948-959.