



COMMENT ON ZHOU ET AL.

Cost-effectiveness of Diabetes Prevention Interventions Targeting High-risk Individuals and Whole Populations: A Systematic Review. *Diabetes Care* 2020;43:1593–1616

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In the July issue, Zhou et al. (1) published a systematic review of studies on the cost-effectiveness of interventions for the prevention of type 2 diabetes. Based on the findings from 17 studies (or study arms), from a health system perspective, lifestyle interventions and the use of metformin in high-risk individuals had a median incremental cost-effectiveness ratio (ICER) of US\$12,510 per quality-adjusted life year (QALY) and US\$17,089 per QALY, respectively. All these studies were conducted in high-income countries (HICs), including the U.S., the U.K., the Netherlands, Singapore, Australia, Sweden, and Hong Kong, and were published by July 2017.

These cost-effectiveness data from HICs are unlikely to be generalizable to low- and middle-income countries (LMICs), which, apart from facing the heavy and disproportionate burden of type 2 diabetes, are also usually characterized by major shortcomings in their health systems. These include, but are not limited to, scarce human resources for treatment-centered approaches, low quality of care, constrained health funding, and high out-of-pocket health expenditure (2). Thus, identifying cost-effective interventions for diabetes prevention that are tailored to LMICs is an urgent global health priority.

Recent data from LMICs show that lifestyle interventions, with or without the use of metformin, are indeed cost-effective for the prevention of type 2 diabetes. A lifestyle intervention program delivered through a community mobilization approach in Bangladesh had an ICER of international dollars (INT\$) 2,551 per disability-adjusted life year (DALY) over 2 years, from a health system perspective, among individuals with prediabetes (3). From a multipayer perspective, a stepwise approach comprising lifestyle intervention followed by the addition of metformin had an ICER of INT\$14,986 per QALY over 3 years in people with prediabetes in India (4). Most recently, the Kerala Diabetes Prevention Program (K-DPP) from India, a community-based lifestyle intervention program delivered primarily by trained lay peer leaders, was associated with an ICER of US\$50.0 (INT\$163) per QALY over 2 years, from a health system perspective, among those identified to be at high risk on the basis of a high diabetes risk score (5).

While these results are highly encouraging, the special needs of the most socially and economically disadvantaged population subgroups are often not considered in the economic evaluation of health interventions in LMICs. Such groups face a disproportionately greater burden

of disease and out-of-pocket spending on health care, suggesting that interventions benefiting them might well yield high social net gains. In the K-DPP trial, we compared the cost-effectiveness of the intervention between individuals reporting themselves to be employed ($n = 728$) versus those who were not ($n = 279$). We found that the latter group experienced a larger QALY gain compared with their paid counterparts over 2 years (0.08 vs. 0.02, $P = 0.011$), but societal cost differences were not statistically different from each other (US\$84.4 vs. US\$–32.3, $P = 0.363$). While this exploratory analysis is likely to be underpowered, exploring such heterogeneity in the costs and benefits of the intervention can yield important policy insights for scaling up the intervention and contribute to the social good.

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