COMMENTS AND RESPONSES

Comment on: Zhang et al. A1C Level and Future Risk of Diabetes: A Systematic Review. Diabetes Care 2010;33:1665–1673

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The recent systematic review by Zhang et al. (1) prompted us to examine A1C and risk factor data that were collected in Canada last year as part of a series of CANRISK diabetes screening projects (2). These data include both self-reported risk factors required to calculate the FINDRISC diabetes risk score (2) as well as A1C and standard glucose tests (fasting plasma glucose and 2-h 75-g oral glucose tolerance test [OGTT]). The resulting convenience sample of 1,057 adults (aged 29–75 years) was obtained from a mixed ethnic group from Vancouver, West Toronto, and rural New Brunswick (mean age 56 years, 57% white, and 70% female). Using World Health Organization (WHO) standard definitions, this combined sample yielded significant rates of screen-detected diabetes (4%), isolated impaired fasting glucose (IFG) (4%), isolated impaired glucose tolerance (IGT) (15%), and "high-risk prediabetes" (i.e., both IGT and IFG [3%]).

FINDRISC was developed from the Finnish Diabetes Prevention Study and provides a prediction of 10-year diabetes risk based on eight risk factors (3). This allows us to stratify the dataset according to A1C strata used by Zhang et al. (1) in their recent systematic review and then compare the predicted (5-year) diabetes incidence for FINDRISC versus their estimates (except for A1C $< 5.0\%$ where we had only three cases). The resulting 5-year diabetes incidence rates using FINDRISC are consistently lower (the results of Zhang et al. (1) are in parentheses): *1*) 4% for A1C 5.0–5.49% (<9%), *2*) 6% for A1C 5.5–5.9% (9–25%), *3*) 9% for A1C 6.0–6.5% (25–50%), and *4*) 12% for A1C $\geq 6.1\%$ (54%). As context, obesity rates for these respective A1C groups were *1*) 9%, *2*) 16%, *3*) 26%, and *4*) 36% and for diabetes maternal history *1*) 21%, *2*) 21%, *3*) 28%, and *4*) 28%.

In conclusion, A1C review of Zhang et al. (1) appears to overpredict future diabetes incidence, particularly for those with high A1C levels; our FINDRISC results found no observed "steep increase across the range of A1C from 5.0 to 6.5%," but rather a steady increase in diabetes risk (2 to 3 percentage points of incidence for each step upwards in A1C category). Even the highest A1C category (A1C >6.1%) is unlikely to exceed 12% diabetes incidence over 5 years—this is well below the 40% cumulative incidence expected for "high-risk prediabetes" cases (4,5). This "high-risk prediabetes" target group has the largest ability to benefit from organized diabetes screening and prevention, and yet it can only be determined by OGTT, which is rarely used in opportunistic screening. Operationalizing OGTT in organized screening would therefore depend on a triaged strategy involving initial risk scoring tools such as FINDRISC.

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