

Combating diabetes in China: a long-term perspective is needed



With over 114 million adults living with diabetes (predominately type 2), China has the unwanted claim as being the epicentre of the worldwide diabetes crisis.¹ The estimated prevalence has risen from less than 1% in 1980,² to 11% in 2017.¹ Although adiposity and active smoking are established risk factors for type 2 diabetes,³ the joint effect of these risk factors is still unclear. When considering that previous studies have provided little clarity about the effects of smoking cessation on diabetes risk, there is much to learn.

In *The Lancet Public Health*, Xin Liu and colleagues⁴ addressed these issues using data from a large cohort of Chinese residents with a relatively long follow-up. Since previous studies have focused on populations from high-income countries, this study makes an important contribution to our understanding of the association between smoking and smoking cessation and diabetes in a Chinese population. The authors found that male smokers (n=134 975; 68%) had a higher risk for diabetes than non-smokers (adjusted hazard ratio [HR] of 1·18 [95% CI 1·12–1·25] for urban men and 1·10 [1·05–1·15] for rural men), with the risk increasing with higher quantities smoked and earlier age of initiation. Importantly, they also found no significant excess risk among men within 5 years following voluntary cessation of smoking (0·92 [0·75–1·12]; distinct from stopping smoking because of illness; 1·42 [1·23–1·63]).

Although women who had smoked regularly had a higher risk of diabetes than non-smokers (HR 1·33 [95% CI 1·20–1·47]), the interpretation was difficult because of the lower numbers of female smokers (n=7811; 3%). Clearly, the relative low number of smokers among Chinese women is good news, but it should not be assumed that this low smoking prevalence will continue in an increasingly changing culture, as highlighted by increasing adiposity. The tobacco industry is likely to view these women as an untapped market,⁵ and so public health strategies will be needed to respond to such challenges.

The study⁴ has convincing and clear messages. First, the warning: if you are overweight or obese, you are at a two times to five times higher risk of developing diabetes than people with normal bodyweight. If you

are overweight or obese and smoking, then your risk increases with the quantity smoked (up to nine times higher). Second, the good news: if you stop smoking before the onset of diabetes, this elevated risk might be removed.

This outcome has important implications for health service planners and policy makers in China regarding the prevention and control for diabetes. Early detection and appropriate management will remain crucial for reduction of complications and premature death in the short-term and medium-term. However, with a population the size of China, these responsive strategies are likely to become overwhelmed. As the authors noted, irrespective of changes in smoking prevalence through tobacco control programmes, the health burden caused by smoking, including diabetes, lung cancer, and cardiovascular disease, would still be seen for 20–30 years into the future.

Clearly, a longer-term perspective is needed that focuses on prevention, and for this reason, considerable resources should be allocated to the promotion of healthy lifestyles to reduce obesity and cigarette smoking. Educating children on healthy lifestyles should be a key focus, so as to encourage good lifelong habits, but children also need older role models in the wider population to show this behaviour.

Unfortunately, the very high rates of smoking among Chinese men is not new information.^{6,7} The crippling health consequences of smoking itself should be enough of an incentive to take acute steps to reduce the population smoking prevalence in China. This additional evidence of the association between smoking and diabetes only adds to that incentive. Paradoxically, this evidence could be good news because by increasing efforts to reduce smoking prevalence, the diabetes burden could also be reduced in the longer term.

A few points of clarification are worth noting. We take the authors' suggestion that the tobacco epidemic is still at an early stage⁸ to mean that the impact of this epidemic is still at an early stage. Thankfully, developments in smoking prevalence are more favourable, with a Chinese study, published in 2016,⁶ reporting that the smoking prevalence in

Published Online
March 13, 2018
[http://dx.doi.org/10.1016/S2468-2667\(18\)30048-3](http://dx.doi.org/10.1016/S2468-2667(18)30048-3)
See [Articles](#) page e167

China has decreased between 1991 and 2011, rather than increased. Ultimately, an even greater decrease is needed.

An unanswered question posed by the study results⁴ is why the HRs are greater in urban than rural men. Could it be the additional effect of pollution or some other lifestyle factors specific to urban areas? The analysis strategy used by the authors makes this question difficult to assess, because they used separate models for urban and rural men. Although this approach has the statistical advantage of allowing for a different baseline hazard in each stratum, it also precludes direct comparisons of key variables of interest. With the development of additional survival methods, such as flexible parametric survival models,⁹ further analyses need not be constrained in this way.

Finally, short-term and medium-term projections of the prevalence of diabetes might give decision makers a more realistic view of the burden they might expect in future years. Although the results are likely to be daunting, they would inform strategies for diabetes management and control.

*Xue Qin Yu, Peter Baade

Cancer Council NSW, Sydney, NSW, Australia (XQY); Sydney School of Public Health, University of Sydney, Sydney, NSW, Australia (XQY); Cancer Council Queensland, Brisbane, QLD, Australia (PB); and Menzies Health Institute Queensland, Griffith University, Gold Coast, QLD, Australia (PB)
xueqiny@nswcc.org.au

We declare no competing interests.

Copyright © The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY 4.0 license.

- 1 IDF. IDF diabetes atlas, 8th edn. Brussels: International Diabetes Federation, 2017.
- 2 National Collaborative Group of Diabetes Study. A mass survey of diabetes mellitus in a population of 300,000 in 14 provinces and municipalities in China. *Zhonghua Nei Ke Za Zhi* 1981; **20**: 678–83 (in Chinese).
- 3 Dale CE, Fatemifar G, Palmer TM, et al. Causal associations of adiposity and body fat distribution with coronary heart disease, stroke subtypes, and type 2 diabetes mellitus: a Mendelian randomization analysis. *Circulation* 2017; **135**: 2373–88.
- 4 Liu X, Bragg F, Yang L, et al. Smoking and smoking cessation in relation to risk of diabetes in Chinese men and women: a 9-year prospective study of 0.5 million people. *Lancet Public Health* 2018; published online March 13. [http://dx.doi.org/10.1016/S2468-2667\(18\)30026-4](http://dx.doi.org/10.1016/S2468-2667(18)30026-4).
- 5 Koplan J, Eriksen M. Smoking cessation for Chinese men and prevention for women. *Lancet* 2015; **386**: 1422–23.
- 6 Li S, Meng L, Chiolerio A, Ma C, Xi B. Trends in smoking prevalence and attributable mortality in China, 1991–2011. *Prev Med* 2016; **93**: 82–87.
- 7 Liu S, Zhang M, Yang L, et al. Prevalence and patterns of tobacco smoking among Chinese adult men and women: findings of the 2010 national smoking survey. *J Epidemiol Community Health* 2017; **71**: 154–61.
- 8 Chen Z, Peto R, Zhou M, et al. Contrasting male and female trends in tobacco-attributed mortality in China: evidence from successive nationwide prospective cohort studies. *Lancet* 2015; **386**: 1447–56.
- 9 Lambert PC, Royston P. Further development of flexible parametric models for survival analysis. *Stata J* 2009; **9**: 265–90.