Socio-economic disadvantage and cardiovascular risk factors in young Aboriginal and Torres Strait Islander Australians

Katherine A Thurber[1], Katy JL Bell[2]

Sustaining the "deadly progress" in averting cardiovascular disease requires comprehensive risk assessment and Indigenous community-specific evidence

That cardiovascular disease is a leading cause of death among both Aboriginal and Torres Strait Islander and non-Indigenous Australians is recognised. But the impressive gains in preventing cardiovascular disease deaths among Aboriginal and Torres Strait Islander Australians are perhaps less well known: annual cardiovascular mortality rates fell from more 400 per 100 000 Indigenous Australians in 1998 to just over 250 per 100 000 in 2012.[1] Critical to the "deadly progress" in preventing cardiovascular disease have been large falls in the prevalence of smoking,[2] especially among young people; the prevalence of smoking among 15–17 year-olds declined from 30% in 1994 to 17% in 2014–15,[3] and among 18–24 year-olds from 51% in 2004 to 37% in 2014–15.[2]

In this issue of the *MJA*, Juonala and his colleagues describe associations between socio-economic position at birth and levels of cardiovascular risk factors in late childhood and early adulthood (ages 11, 18 and 25 years) among participants of the Aboriginal Birth Cohort Study in the Northern Territory.[4] Their main findings were that greater socio-economic disadvantage at birth was associated with more favourable levels of some cardiovascular risk factors (body mass index [BMI], systolic blood pressure, low density lipoprotein [LDL]-cholesterol), but less favourable levels of others (high density lipoprotein [HDL]-cholesterol, triglycerides).

The finding that early socio-economic disadvantage is associated with lower BMI is consistent with previous reports of lower BMI among younger Aboriginal and Torres Strait Islander children in more disadvantaged regions.[5–7] This contrasts with the inverse relationship between socio-economic advantage and BMI in children and young people in the broader Australian population,[8] but is consistent with the socio-economic patterning of BMI among children in low and middle income countries.[9] Disadvantage and food insecurity can lead to both underweight and overweight or obesity in the same community or even household;[10] this double burden of malnutrition contributes to a lower mean BMI in more disadvantaged communities. On a national basis, substantially more Aboriginal and Torres Strait Islander children are overweight than underweight (30% *v* 8%[11]). Strategies for promoting healthy BMI, particularly in disadvantaged areas, need to take unhealthy BMI at both ends of the spectrum into account.

The availability of data on the other cardiovascular disease risk factors examined by Juonala and colleagues is limited. One study of 657 Aboriginal young people in New South Wales found no significant association between socio-economic status and blood pressure, but the estimates reported were imprecise.[12] This and other studies found that blood pressure was strongly correlated with BMI, which suggests that the association between socio-economic status at birth and blood pressure reported by Juonala and his co-authors might be partially explained by incomplete adjustment for BMI. Such residual confounding could also explain their findings regarding LDL-cholesterol, but not HDL-cholesterol or triglyceride levels.

Juonala and colleagues did not examine a number of key cardiovascular disease risk factors, including smoking status, diabetes, and renal impairment, the relationships of which with early socio-economic status may be different to that of BMI. For example, greater disadvantage at birth is associated with intra-uterine growth restriction and lower birthweight.[13] Although low birthweight is associated with lower risk of obesity in Aboriginal and Torres Strait Islander children and adults, it is also associated with reduced nephron mass in childhood and higher risk of renal impairment in adulthood.[13] Similarly, the socio-economic patterning of smoking by Aboriginal and Torres Strait Islander young people may be the same as for Indigenous adults, with lower rates among the most advantaged.[14] These considerations highlight the importance of a comprehensive assessment of cardiovascular disease risk factors, including smoking, renal impairment, and diabetes, as well as BMI, lipid levels, and blood pressure.

Perhaps one of the most important implications of the report by Juonala and colleagues is that health programs and policy need to be based on evidence specific to Aboriginal and Torres Strait Islander communities. Larger, longitudinal studies of cardiovascular disease in Aboriginal and Torres Strait Islander people, undertaken in collaboration with Indigenous communities, would provide valuable additions to the evidence base. Such studies should include participants from a range of geographic areas and residence remoteness, and should assess a comprehensive set of potential risk and protective factors, to enable better understanding of cardiovascular health trajectories in Indigenous communities. Finally, prevention must be community-driven, engaging the community with a whole-of-system approach, supported by policies that target the underlying social, cultural, and environmental determinants of health. In this way, we can

[1] National Centre for Epidemiology and Population Health, Australian National University, Canberra, ACT. [2] The University of Sydney, Sydney, NSW. katy.bell@sydney.edu.au
• doi: 10.5694/mja2.50327 • See Research (Juonala).

continue the "deadly progress" in preventing cardiovascular disease among Australia's First Peoples.

Acknowledgements: We gratefully acknowledge Andrew Hayen (University Technology Sydney), Jason Agostino (Australian National University), and Veronica Matthews (University of Sydney) for their advice.

Competing interests: No relevant disclosures.

Provenance: Commissioned; externally peer reviewed. ■

1 Australian Institute of Health and Welfare. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples (Cat. No. IHW 147). Canberra: AIHW, 2015.

2 Lovett R, Thurber KA, Wright A, et al. Deadly progress: changes in Aboriginal and Torres Strait Islander smoking prevalence, 2004–2015. *Public Health Res Pract* 2017; 27: e2751742.

3 Australian Bureau of Statistics. 4737.0. Aboriginal and Torres Strait Islander Peoples: smoking trends, Australia, 1994 to 2014–15. Oct 2017. https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4737.01994%20to%202014-15?OpenDocument (viewed July 2019).

4 Juonala M, Sjöholm P, Pahkala K, et al. The Australian Aboriginal Birth Cohort study: socio-economic status at birth and cardiovascular risk factors to 25 years of age. *Med J Aust* 2019; 211: 265–270.

5 Thurber KA, Dobbins T, Neeman T, et al. Body mass index trajectories of Indigenous Australian children and relation to screen time, diet, and demographic factors. *Obesity* 2017; 25: 747–756.

6 Thurber KA, Dobbins T, Kirk M, et al. Early life predictors of increased body mass index among Indigenous Australian children. *PLoS One* 2015; 10: e0130039.

7 Spurrier NJ, Volkmer RE, Abdallah CA, Chong A. South Australian four-year-old Aboriginal children: residence and socioeconomic status influence weight. *Aust N Z J Public Health* 2012; 36: 285–290.

8 Jansen P, Mensah F, Nicholson J, Wake M. Family and neighbourhood socioeconomic inequalities in childhood trajectories of BMI and overweight: longitudinal study of Australian children. *PLoS One* 2013; 8: e69676.

9 Dinsa GD, Goryakin Y, Fumagalli E, Suhrcke M. Obesity and socioeconomic status in developing countries: a systematic review. *Obes Rev* 2012; 13: 1067–1079.

10 Burns C. A review of the literature describing the link between poverty, food insecurity and obesity with specific reference to Australia. Melbourne: VicHealth, 2004. https://www.vichealth.vic.gov.au/~/media/ResourceCentre/PublicationsandResources/healthy%20eating/Literature%20Review%20Poverty_Obesity_Food%20Insecurity.ashx (viewed July 2019).

11 Australian Bureau of Statistics. 4727.0.55.006. Australian Aboriginal and Torres Strait Islander Health Survey: updated results, 2012–13. June 2014. http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/4727.0.55.006 (viewed July 2019).

12 Larkins N, Teixeira-Pinto A, Banks E, et al; SEARCH investigators. Blood pressure among Australian Aboriginal children. *J Hypertens* 2017; 35: 1801–1807.

13 McNamara BJ, Gubhaju L, Chamberlain C, et al. Early life influences on cardio-metabolic disease risk in aboriginal populations: what is the evidence? A systematic review of longitudinal and case–control studies. *Int J Epidemiol* 2012; 41: 1661–1682.

14 Thomas DP, Briggs V, Anderson IP, Cunningham J. The social determinants of being an Indigenous non-smoker. *Aust N Z J Public Health* 2008; 32: 110–116. ■