

6% who were smokers, in the occupational groups with lowest incidence.

The authors conclude: 'Our study shows that there are occupational groups, including motor vehicle drivers, manufacturing workers and cleaners, where the incidence of type 2 diabetes is increased three fold and, furthermore, that employees in these occupations already have a higher prevalence of lifestyle risk factors in their twenties and thirties.

'If interventions could reduce weight and smoking and increase physical activity among employees in these occupations, major health and productivity gains may be made.'

Diabetes causes a lot of lost days from work, and the workplace is a very accessible target for health improvement initiatives. The increasing evidence for lifestyle measures to prevent and possibly cure type 2 diabetes would make this a very effective public health intervention.

DR MATTHEW LOCKYER
Carlsson S, Andersson T, Talback M, Feychting M. Incidence and prevalence of type 2 diabetes by occupation: results from all Swedish employees. *Diabetologia*; Published online 17 September 2019

Sexual health

Gonorrhoea may be transmitted by kissing in men who have sex with men

Men who have sex with men (MSM) may transmit oropharyngeal gonorrhoea to partners by kissing, a cross-sectional study from Australia has found.

Patients attending a large sexual health clinic in Melbourne between March 2016 and February 2017, were asked to complete a computer-assisted questionnaire. The questions covered demographics and sexual practices including kissing with tongues. Univariable and multivariable logistic regression analyses were carried out to examine associations between oropharyngeal gonorrhoea and three categories of partners; kissing only partners, sex only partners, kissing with sex partners.

A total of 3,677 responses were eligible for analysis. The median age of respondents was 30 (interquartile range 25 to 37), 57% were born in Australia and 2.5% had been diagnosed with HIV.

Positivity for oropharyngeal gonorrhoea was 6.2% (95% CI: 5.5-7.1%), anorectal gonorrhoea 5.9% (95% CI: 5.2-6.8%), urethral gonorrhoea 2.7% (95% CI: 2.2-3.3%). Virtually all men, 95.2%, (95% CI: 94.5-95.9%) had kissing with sex partners, 70.4% (95% CI: 68.9-71.8%) had kissing only partners, and 38.3% (95% CI: 36.7-39.9%) had sex only partners in the past three months. Just over a quarter (26.7%) of men (95% CI: 25.3-28.1%) had partners in all three categories.

Having a greater number of kissing only partners or kissing with sex partners was significantly associated

with oropharyngeal gonorrhoea in both univariable and multivariable analyses. The adjusted odds ratio (OR) of having oropharyngeal gonorrhoea was 1.46 (95% CI: 1.04-2.06) for men with four or more kissing only partners and 1.81 (95% CI: 1.17-2.79) for four or more kissing with sex partners, compared with men who had one partner or no partners in these categories.

Gonorrhoea infection is common in MSM. The rise in infection rates is a public health concern particularly as more antibiotic-resistant cases have been documented in this group in many countries.

Most strategies to prevent transmission of gonorrhoea have concentrated on encouraging the use of condoms for anal sex among MSM. The evidence for this approach is lacking as modelling studies suggest that the proportion of incident gonorrhoea transmission from urethra to oropharynx or anorectum is relatively small. Gonorrhoea is found in saliva and some earlier studies had suggested transmission from the oropharynx might be more common than expected. Tongue kissing as a mode of transmission has been recognised in case reports as far back as the 1970s.

This is the first study that provides empirical evidence of an association between kissing and oropharyngeal gonorrhoea transmission among MSM. The study authors conclude: 'Our results suggest kissing with or without sex may be a risk factor for oropharyngeal gonorrhoea.'

One challenge is what public health message to promote to MSM as previous studies have shown that this group regard kissing as important for intimacy. However, some MSM might be willing to avoid sexual practices such as oro-anal sex to reduce this risk.

DR RICHARD MA
Chow EPF, Cornelisse VJ, Williamson DA et al. Kissing may be an important and neglected risk factor for oropharyngeal gonorrhoea: a cross-sectional study in men who have sex with men. *Sex Transm Infect*. Epub ahead of print 9 May 2019. doi:10.1136/sextrans-2018-053896

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