

# Study finds manufacturing, driving and cleaning jobs linked to the highest risk of developing type 2 diabetes

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Professional drivers, manufacturing workers and cleaners have a threefold increased risk of type 2 diabetes (T2D) compared with university teachers and physiotherapists, according to a new study presented at this year's Annual Meeting of the European Association for the Study of Diabetes (EASD) and published in *Diabetologia* (the journal of EASD).

The differences are apparently linked, say the authors, to the prevalence of lifestyle risk factors. If workplace interventions could reduce weight and increase physical activity among employees in these occupations, major health gains may be made.

While previous studies have shown that diabetes risk increases with lower socioeconomic status, little research exists on occupation and risk of T2D. This study—by Dr. Sofia Carlsson, Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden, and colleagues—considered possible associations between risk of T2D and the 30 most common occupations.

The Swedish Total Population Register was used to identify all Swedish citizens born between 1937 and 1979. Of these, a total of 4,550,892 persons were gainfully employed, between 2001 and 2013; this constituted the study population. Information on occupation and education was obtained from LISA—the Longitudinal Integrated

Database for Health Insurance and Labour Market Studies—with employment categorised using the Swedish Standard Classification of Occupations. To be categorised into a specific occupation, a person had to have that occupation for 2 consecutive years.

Follow up, for incidence of diabetes at age 35 or over, was from 2006 until 31st December 2015, using the National Patient and Prescribed Drug Registers. During the follow up period, 201,717 new cases were identified. Prevalent cases (total number at a set point) were identified using the same registers; in 2013 these were numbered at 150,131. Historical information on height, weight, fitness and smoking was obtained from the Military Conscription and Medical Birth Registers, to produce BMI calculations for men conscripted at age 18 (57% of the female study population) and women at first trimester (mean age 29, 50% of the male study population).

Striking differences were found between the occupational groups. The overall prevalence of diabetes in the Swedish working population in 2013 was 4.2% (5.2% in men; 3.2% in women) However prevalence ranged from 7.8% in male manufacturing labourers and 8.8 % in motor vehicle drivers, to only 2.5% in male computer scientists. In women, diabetes prevalence was highest in manufacturing workers (6.4%), kitchen assistants (5.5%) and cleaners (5.1%) and lowest amongst specialist managers (1.2%). Separate analysis of the over 55s revealed that, in men, diabetes prevalence was 14.9% in manufacturing workers, 14.2% in motor vehicle drivers and 13.1% in office clerks. In women over 55 years, the highest prevalence was seen in manufacturing workers (10.7%), kitchen assistants (8.7%) and cleaners (8.3%). (see link to online appendix for detailed information on diabetes rates, and also figures 1-3 of paper).

Age standardised incidence of diabetes (number of new cases per 1000 people per year) was 5.19 overall (6.36 in men; 4.03 in women); but

again considerable occupational differences were noted. Amongst men, incidence was highest amongst manufacturing workers (9.41), motor vehicle drivers (9.32), mobile plant operators including agricultural (8.31), personal carers (8.17), and stores and transport clerks (7.87) - and lowest amongst university teachers (3.44), architects and civil engineers (3.83). For women, the incidence was highest amongst manufacturing labourers (7.2), cleaners (6.18), kitchen assistants (5.65), cooks, waitresses and housekeepers (5.01) and personal carers (5.00) - and lowest amongst physiotherapists and dental hygienists (2.20), writers and creative or performing artists (2.27).

Further analysis revealed that manufacturing, male workers were at a 49% higher risk of developing diabetes, and female workers at an 80% higher risk, when compared with the total Swedish working population. In contrast, a 46% reduced incidence was seen in male college and university teachers, and a 45% reduced incidence was found in female physiotherapists and dental hygienists. The authors estimate that almost half (45-46%) of cases of T2D would be eliminated if the total working population had the same incidence as college / university teachers, physiotherapists and dental hygienists.

For people recorded as having no occupation in the study period, for example, people on disability pension or unemployed (12.1% of individuals born 1937-1979), incidence of T2D was also high; 8.29 new cases per 1000 people per year overall, and higher in men (8.89) than in women (7.72). In 2013, prevalence in this group was 8.9% in total (9.7% in men and 8.2% in women).

There was a strong, positive association found between incidence of T2D and mean BMI in both men and women. The prevalence of being overweight at conscription age 18 was found to be high in men who subsequently went on to work as mobile plant operators (including agricultural, crane and lifting-truck operators) (16.8%) motor vehicle

drivers (16.3%), and manufacturing workers (14.1%); whereas in future college and university teachers, only 6.5% were overweight at conscription age; with similar inverse patterns for physical fitness. In women, 29-30% of cleaners, manufacturing workers and kitchen assistants were overweight during the first pregnancy (mean age 29 years), and 24-30% were smokers. In writers, creative/ performing artists, physiotherapists and dental hygienists the corresponding estimates were 18% for being overweight and 6% for smoking.

The authors say: "The association between [occupation](#) and T2DM coincided with vast differences in prevalence of lifestyle factors—individuals in high risk occupations were more likely to be overweight, smoke and have lower physical fitness than those in low risk occupations, and this most likely contributes to a high prevalence and incidence of type 2 diabetes".

These differences were seen at young ages (conscription and first pregnancy), adding to the findings of previous studies that metabolic differences can be seen in diabetic individuals up to 25 years prior to diagnosis. However the authors note that differences in lifestyle factors might be even higher at older ages and that, on top of lifestyle selection into different occupations, it is possible that "working life adds more risk factors in the form of long sitting times, irregular working hours and stress." They recommend the role of working conditions in the development of T2DM as a subject for future investigation.

As in previous research, an association between low socioeconomic status and T2DM was noted—however this comprehensive, nationwide study has shown that job title is a much more specific indicator of diabetes risk—with above 7% (men and women combined) of employees diagnosed with the condition in occupations such as manufacturing work and 8.5% in motor vehicle driving (also men and women combined). Prevalence in these occupations was even higher in

the over 55s. This is potential issue, the authors note, when most countries are looking to increase retirement age, as diabetes may potentially hinder prolonged working life.

The authors say: "To reduce the future diabetes burden it is crucial to curb the inflow of new patients. Intervention studies have consistently shown it is possible to reduce diabetes incidence in high-risk groups by lifestyle modification. If job title can be used as a risk indicator of T2DM, it can be used to identify groups for targeted interventions, and hopefully inspire employers to implement [diabetes](#) prevention programmes tailored to their workforces".

Provided by Diabetologia

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