



Association of paternal preconception alcohol use with offspring development and pregnancy outcomes: A systematic review and meta-analysis

Sarah Khor, Gabby King, Melanie Thitchener, Stephanie Aarsman, Amy Feain, Sharon Zhang, Genevieve Le Bas, Elizabeth Elliot, Liz Spry, Jacqui MacDonald, Samantha Teague, Nyanda McBride, Kayla Mansour, Emmelyn Weller, Delyse Hutchinson

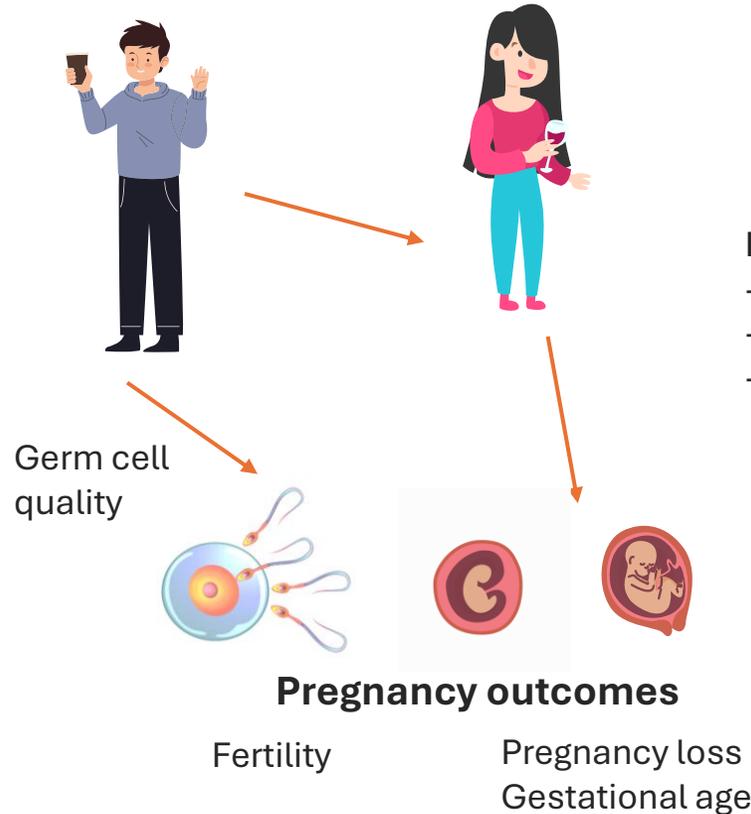
Introduction



There is growing evidence that men's alcohol use in the preconception period may be linked to later pregnancy and offspring outcomes.

Paternal preconception drinking

Maternal drinking



Offspring outcomes

Socio-emotional

- Behavioural
- Cognitive

Alcohol-related outcomes

- Early alcohol experience
- Problematic alcohol use

Physical health

- Physical defects
- Cancer
- Growth



Aims



This systematic meta-analytic review examined the research evidence on the relationship of preconception paternal alcohol use with a range of outcomes, spanning fertility, pregnancy and offspring development.

Definitions	Description
Preconception	Human fathers' alcohol use any timepoint before conception.
Exposure	Variables included any alcohol use vs. none , quantity (e.g. drinks per occasion, drinks per week), frequency (e.g. regular, occasional), risky use/dependence (e.g. binge drinking frequency; >14 drinks per week), alcohol use disorder .
Outcomes	<u>Offspring outcomes:</u> <ul style="list-style-type: none">• Physical health – Physical defects, cancers, weight/growth• Psychosocial – Behaviour, cognitive, socio-emotional• Alcohol-related – Early alcohol experience, problematic alcohol use <u>Pregnancy outcomes:</u> <ul style="list-style-type: none">• Pregnancy – e.g., Spontaneous abortion, recurrent miscarriage• Fertility – e.g., Gamete quality, delays to conception

Methods



- Literature search:
 - Conducted according to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines
 - MEDLINE, Embase, PsycINFO and CINAHL databases
 - ~17,500 articles retrieved, 128 included
- Analysis:
 - Multilevel mixed-effects meta-regression models

Characteristics of studies

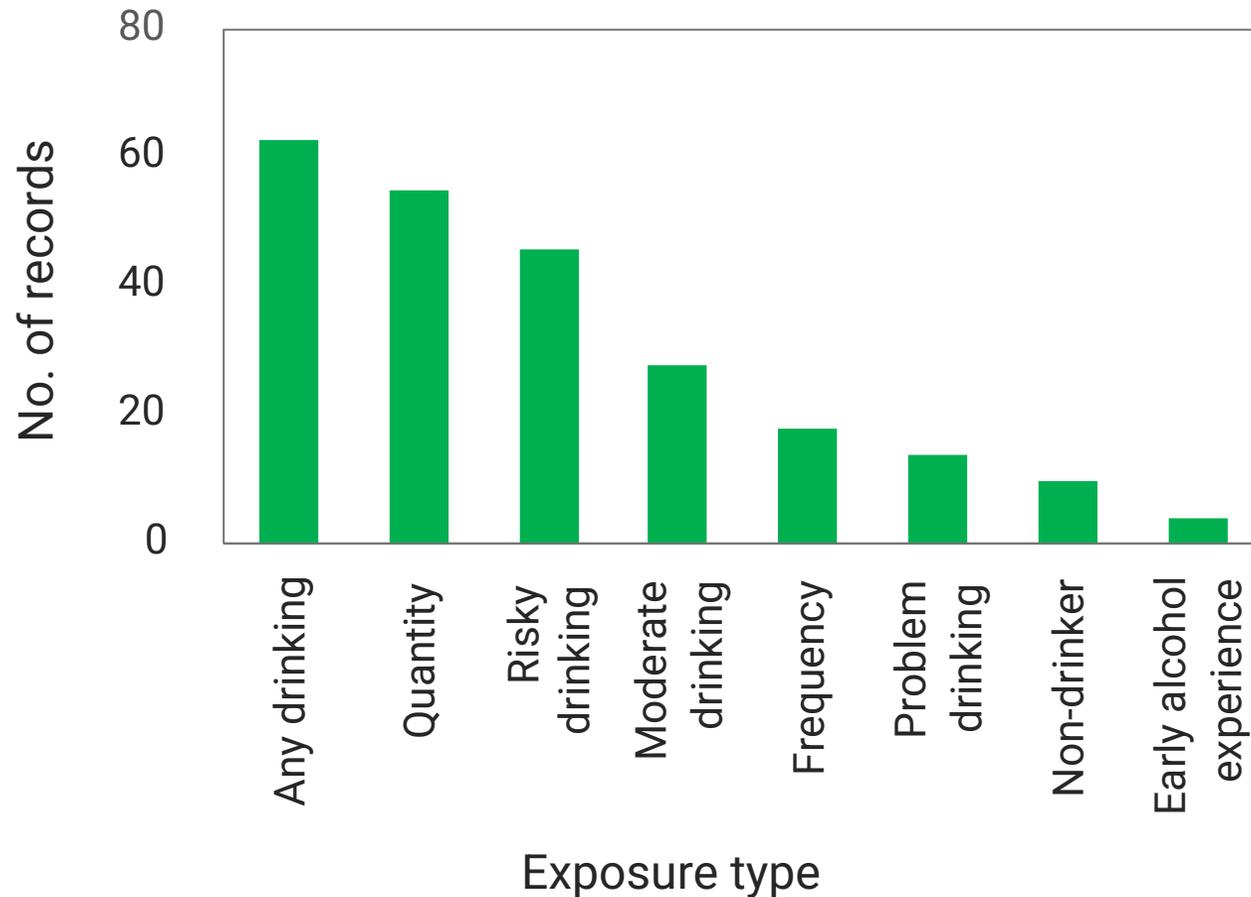


- Quality of the evidence was rated as moderate overall.
- Publications dated back to 1982, with half of publications from 2013 onward.
- Proportion of longitudinal studies has been increasing since 2010.
- Studies largely from Europe (35%), North America (26%) and Asia (25%)

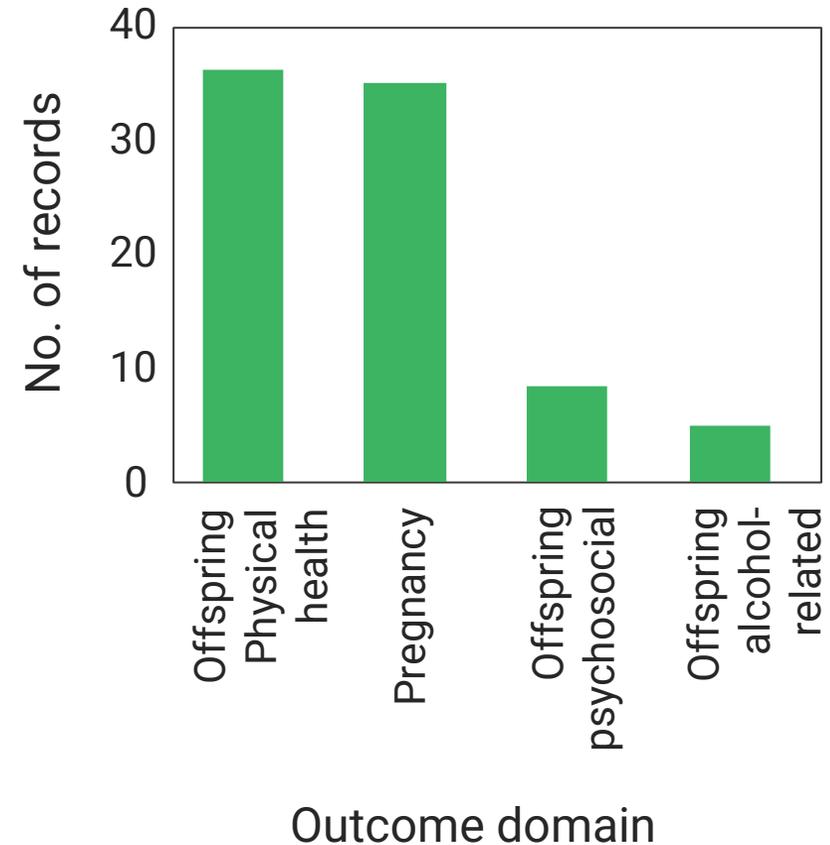
Exposure and outcome characteristics



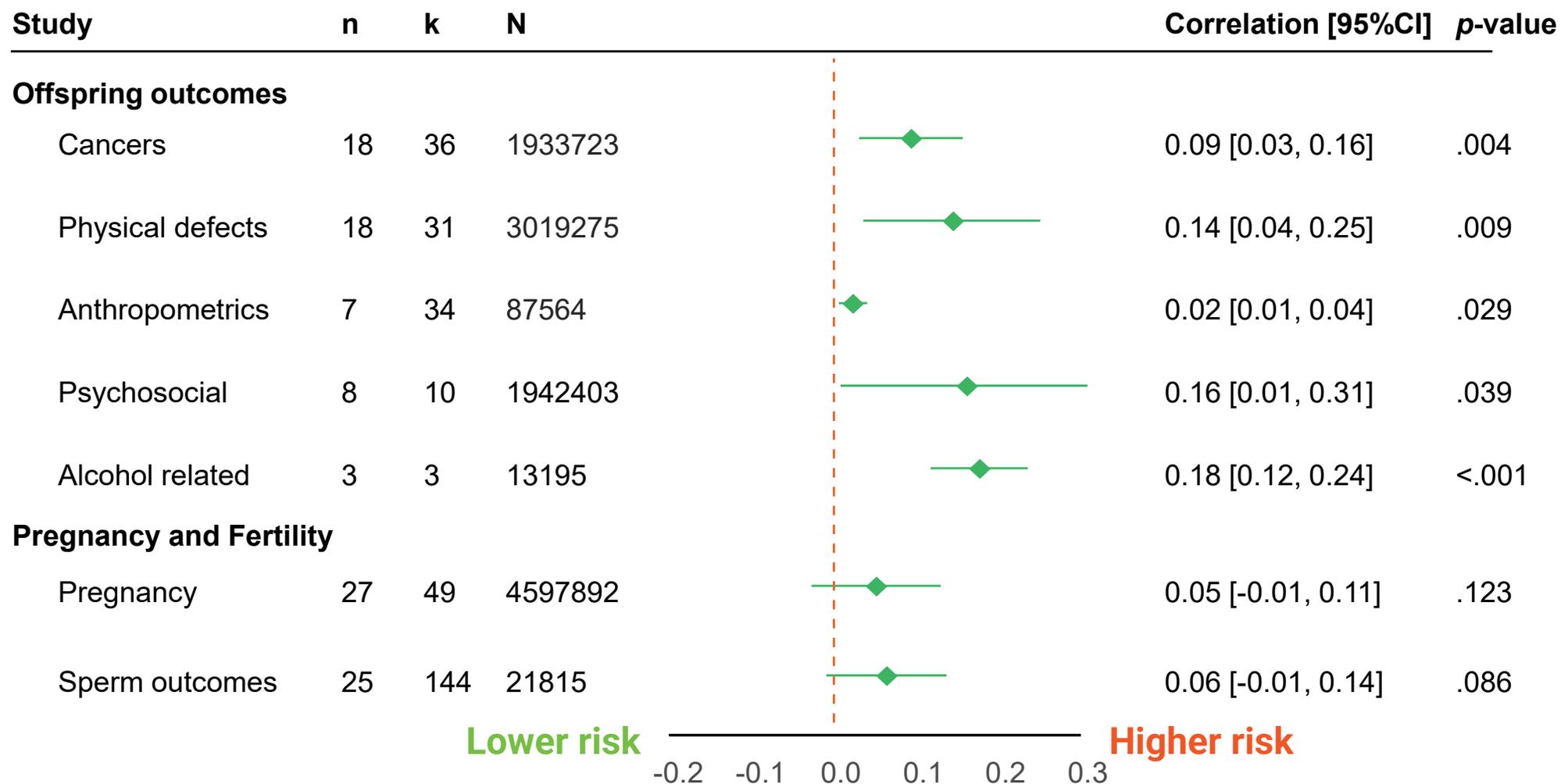
Number of records by exposure type



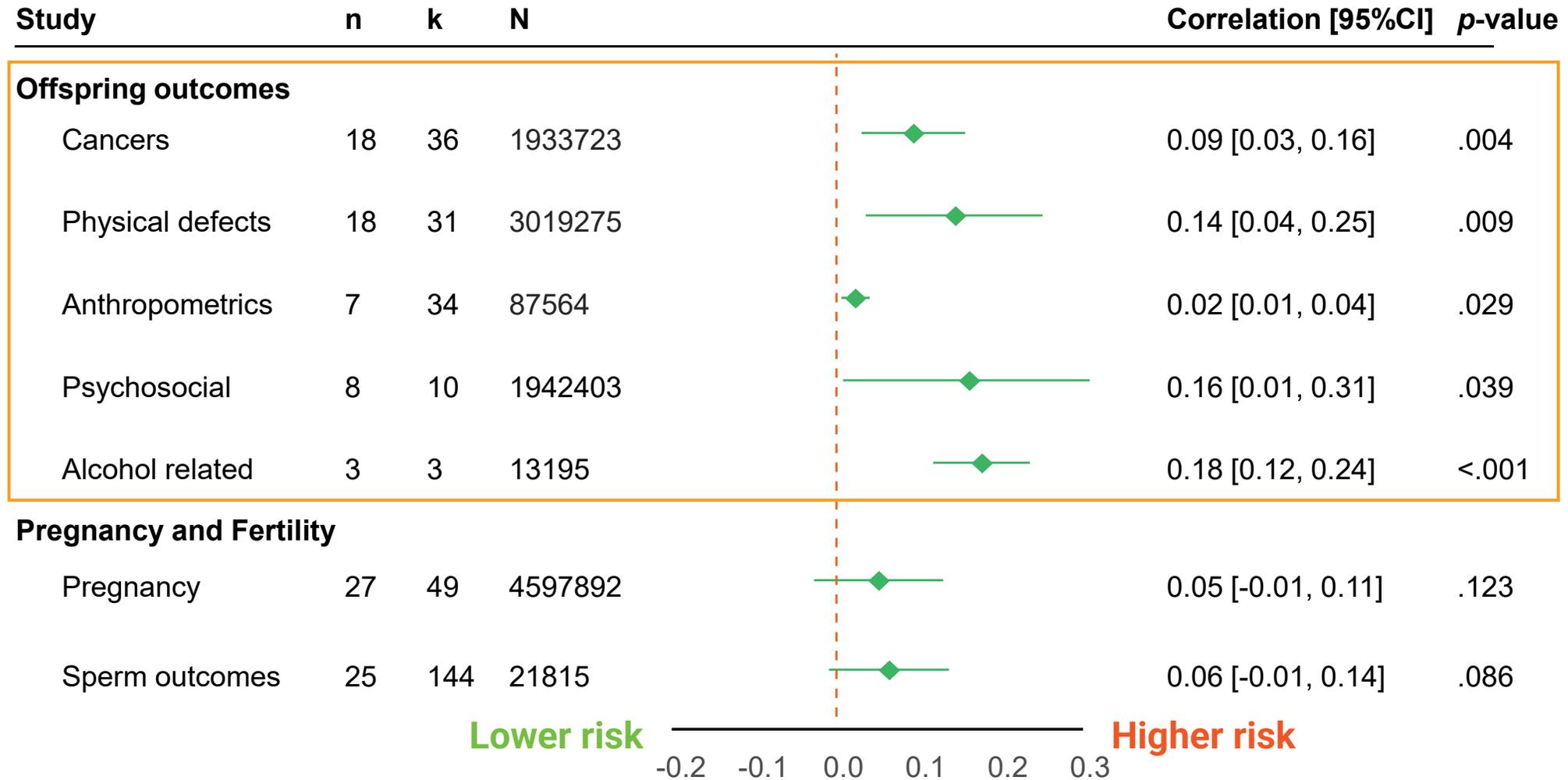
Number of records by outcome domain



Associations for men's alcohol use in preconception with offspring and pregnancy/fertility outcomes

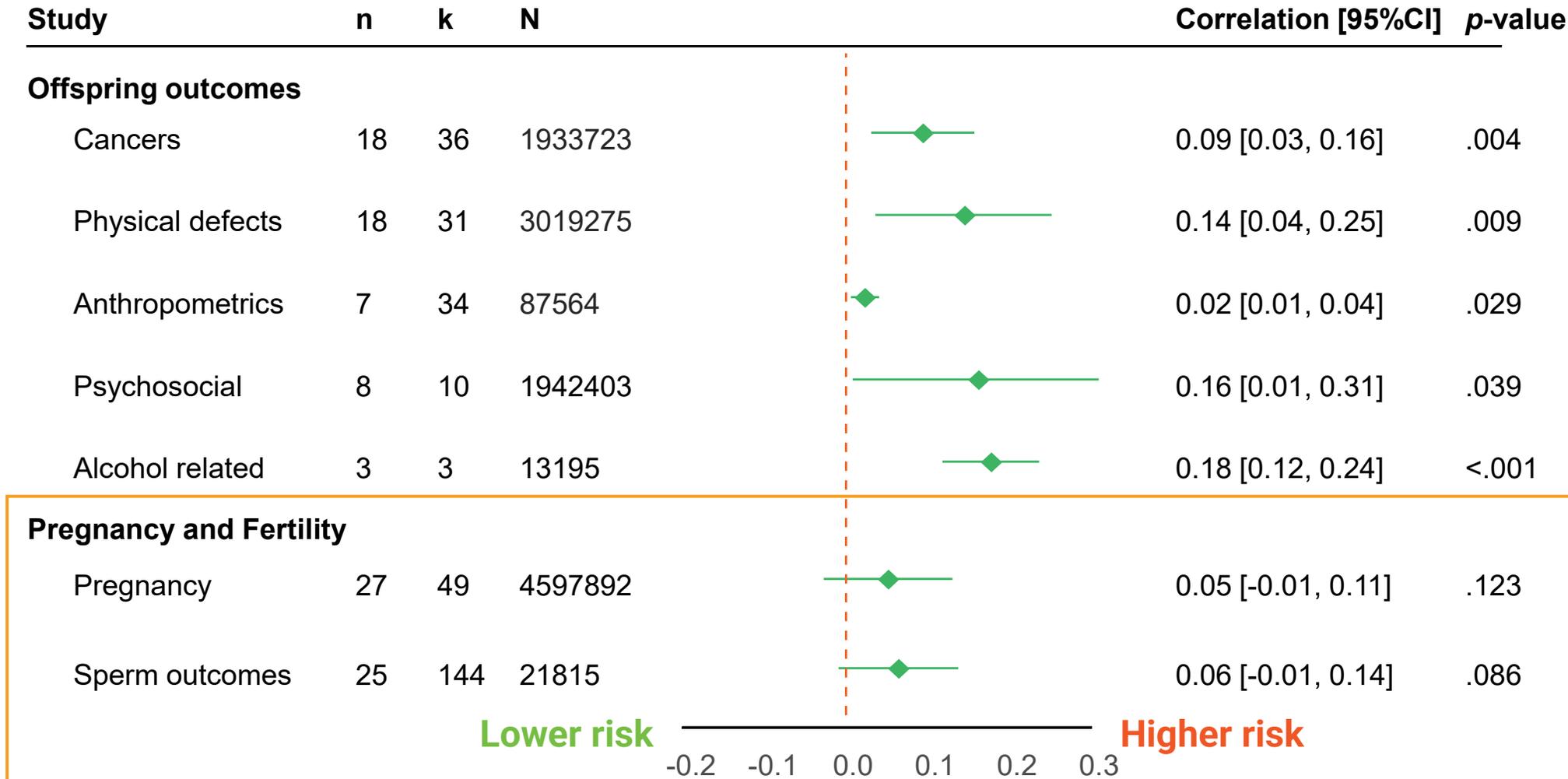


Associations for men's alcohol use in preconception with offspring and pregnancy/fertility outcomes



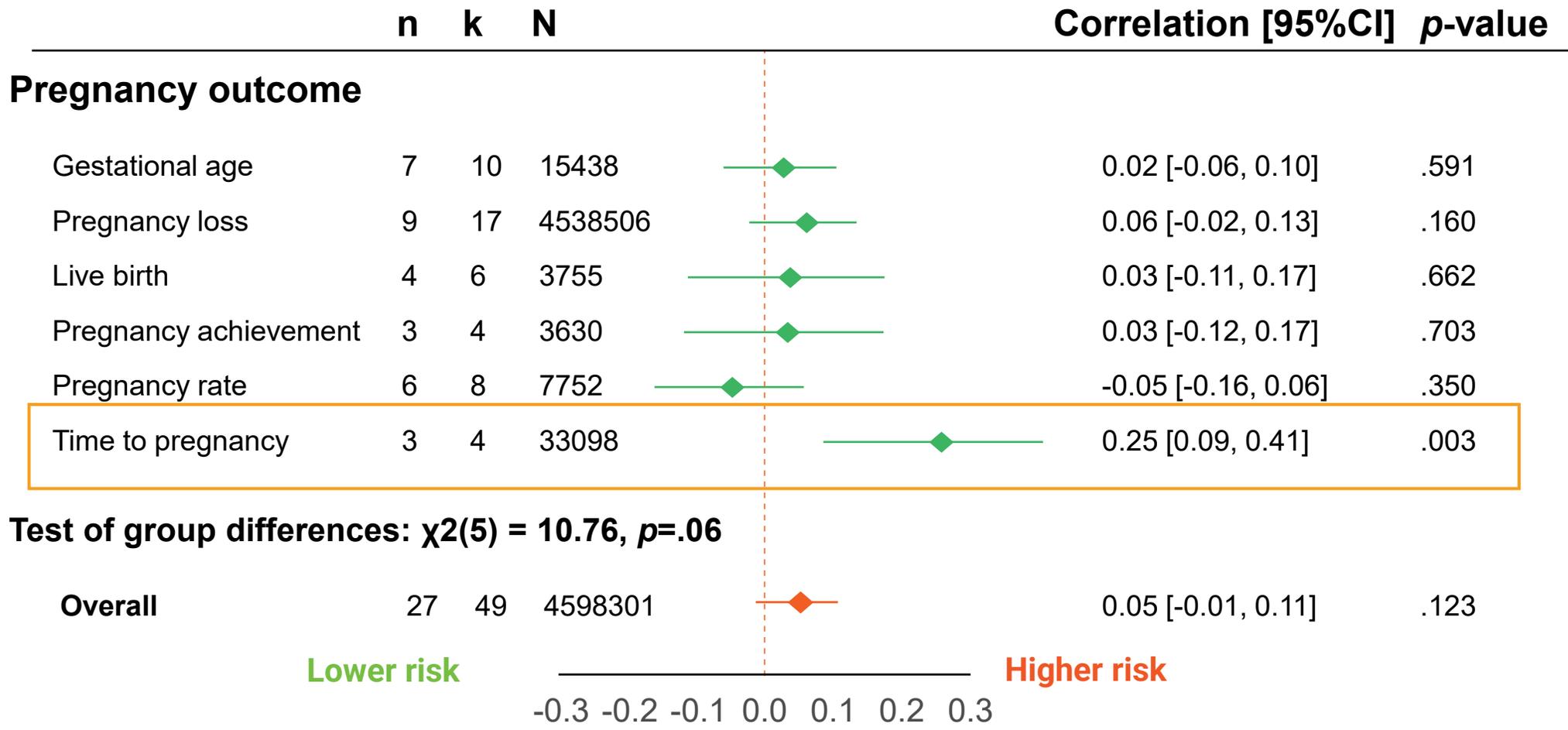
- Preconception drinking in fathers was associated with poorer offspring outcomes, with small effects.

Associations for men's alcohol use in preconception with offspring and pregnancy/fertility outcomes



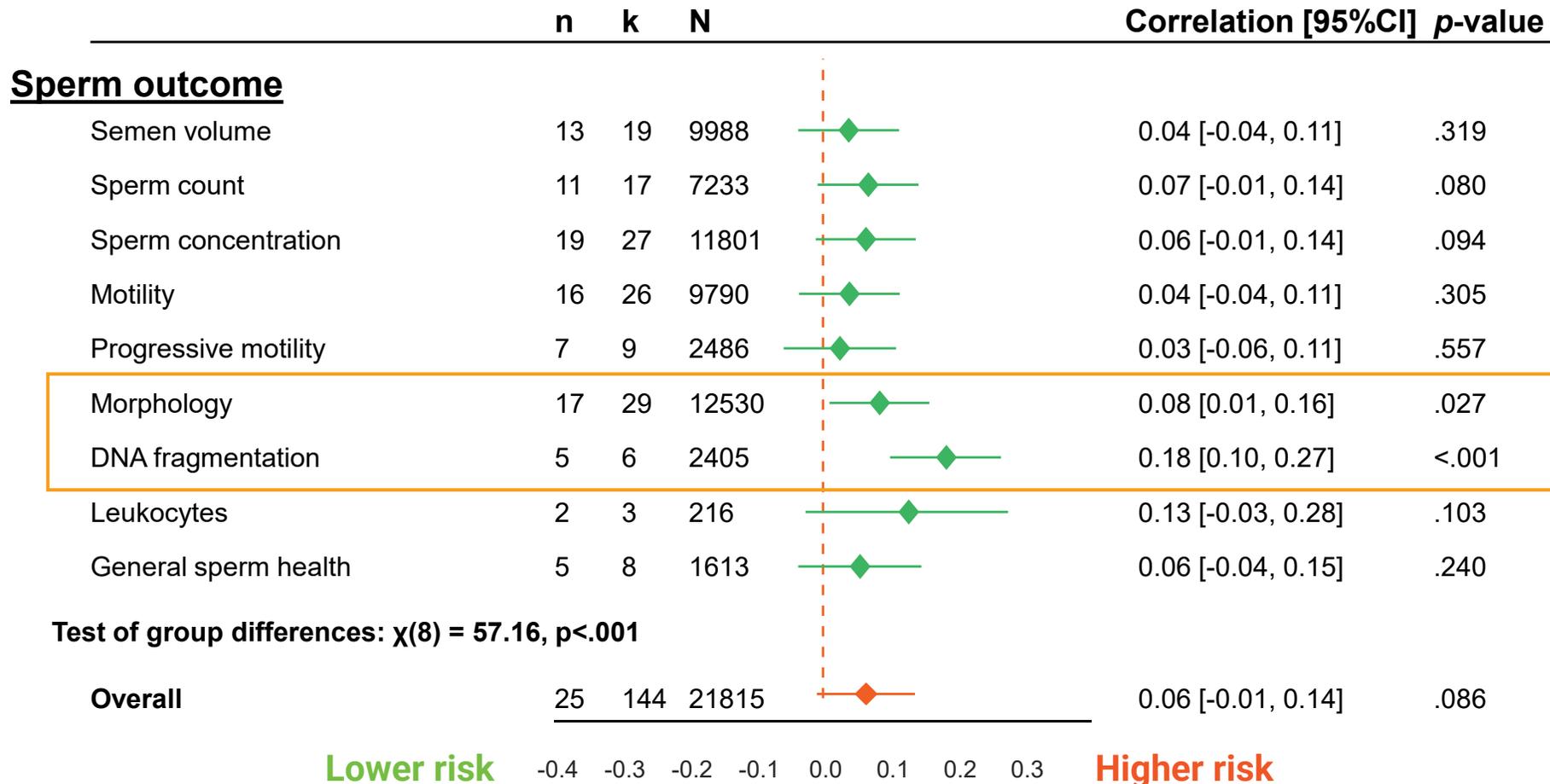
- Pregnancy and sperm outcomes not significant but in the expected direction, suggesting adverse effects.

Associations for men's alcohol use in preconception and pregnancy outcomes



- Trend toward poorer pregnancy outcomes, albeit most effects were not statistically significant.
- Moderate association between preconception paternal alcohol use and a longer time period to conception.

Associations for men's alcohol use in preconception for sperm outcomes



- When examined by various sperm outcomes, paternal alcohol use is adversely associated with sperm morphology and DNA fragmentation.

Summary and limitations



Summary and limitations



- Generalisability of findings is limited by:
 - Literature concentrated in Western Europe and North America.
 - Mostly retrospective reports on physical defects and cancer outcomes.
 - Alcohol typically measured via self or partner report.
- Unadjusted associations did not account for maternal drinking/smoking, and paternal smoking.
 - However, maternal drinking and smoking were generally low in pregnancy.



Implications

- Due to the potentially adverse impacts of men's drinking in preconception on later physical health outcomes in offspring, limiting alcohol consumption three months prior to conception is recommended.
- We recommend that national health guidelines incorporate advice on preconception drinking in men which are currently lacking.



Thank you

sarah.khor@deakin.edu.au

delyse.Hutchinson@deakin.edu.au