

CLUSTERING OF PRECONCEPTION MORBIDITIES IN SCOTLAND: A POPULATION-BASED STUDY

Sarjit Singh¹, Martin F Shaw¹, Deborah A Lawlor², Scott M Nelson¹, Rachel J Kearns¹

¹University of Glasgow, ²University of Bristol

BACKGROUND

- Multimorbidity (MM) is defined as two or more chronic conditions in a person¹
- MM is associated with adverse maternal and neonatal outcomes²
- Preconception multimorbidity lacks a consensus definition, with current definitions overlooking shared mechanisms or pathophysiology
- We aimed to identify condition clusters, explore shared mechanisms, and assess associations with adverse maternal / neonatal outcomes

METHODS

- A population-based study of all nulliparous women delivering in Scotland from Jan 2010 to May 2023
- Chronic conditions defined by the Chronic Condition Indicator Refined system³; chronic prescriptions defined as ≥ 4 prescriptions for a drug class in 1 year
- Clustering of chronic conditions/prescriptions using Ward's D2 method⁴
- Outcomes: maternal/neonatal readmission, critical care admission, or death up to 6 weeks post-delivery
- Statistical analysis: logistic regression adjusting for maternal age, smoking, drug use and ethnicity

RESULTS

- 248,817 nulliparous women delivered in our study period across the whole of Scotland
- 119,014 (47.8%) had a chronic condition / prescription allowing them to be clustered
- We identified 20 distinct clusters
- Most common clusters:
 - Cluster 14: Obesity with depression (30,075 25.3%)
 - Cluster 12: Isolated obesity (26,387 22.2%)
 - Cluster 11: Atopy (10,065 8.46%)
- Adverse outcomes in 7,730 (3.11%) mothers and 45,805 (18.4%) neonates.
- Most adverse events were in cluster 13 (Figure 1):
 - Cluster 13 captured endocrine diseases (including diabetes, thyroid, adrenal pathologies and prescriptions)
 - Maternal aRR: 3.21 (95% CI: 2.61 - 3.94)
 - Neonatal aRR: 3.29 (95% CI: 3.01 - 3.59)

CONCLUSIONS

- We identified 20 clusters of comorbidities
- We observed a disproportionately high likelihood of maternal and neonatal adverse outcomes in women with preconception endocrine disease
- Further work will assess how these clusters of comorbidities interact and aid antenatal risk assessment

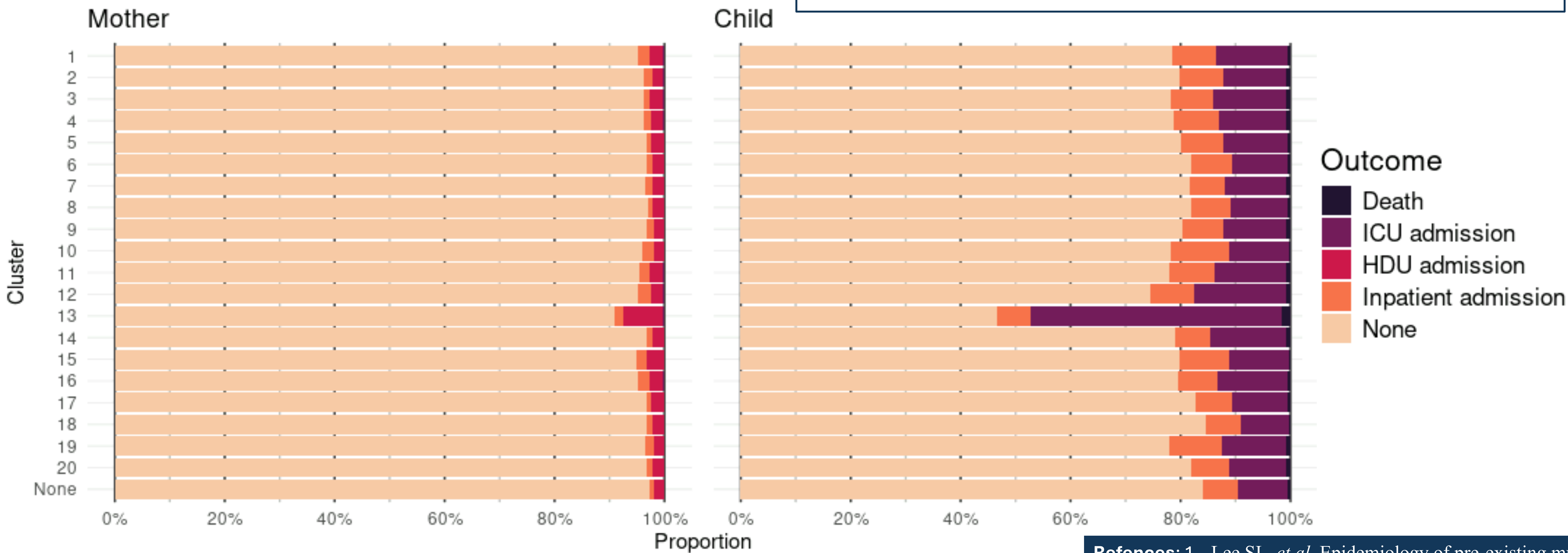


Figure 1: 6-week post-delivery outcomes by maternal preconception cluster

References: 1 – Lee SI., *et al.* Epidemiology of pre-existing multimorbidity in pregnant women in the UK in 2018. *BMC Pregnancy Childbirth* 2022; 22:120
2 – Brown HK, McKnight A, Aker A. Association between pre-pregnancy multimorbidity and adverse maternal outcomes. *Journal of Multimorbidity & Comorbidity* 2022
3 – Healthcare Cost and Utilization Project. Chronic Condition Indicator Refined. 2023. https://hcup-us.ahrq.gov/toolssoftware/chronic_icd10/chronic_icd10.jsp
4 – Ward JH. Hierarchical Grouping to Optimize an Objective Function. *Journal of the American Statistical Association*, 1963 58, 236–244.