

## ***Executive Summary***

### **The relation between staffing, workload and quality of care indicators in 23 Scottish Labour Wards.**

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**Aim:** to test the relation between labour ward workload, process of care and neonatal morbidity indicators.

**Study Design:** a prospective, multicentre observational study.

**Setting:** 23 consultant-led maternity units in Scotland (September 2000).

**Methods:** Workload was observed 4 times daily for 4 weeks, and reported as both occupancy and midwife staffing ratios. Process data were from case note abstraction about rates of CTG, in particular continuous electronic fetal monitoring (CEFM), from the Scottish Audit of Prevention of Medical Emergencies in Labour (SAPMEL).<sup>1</sup> Outcome data were from ISD maternal data (SMR2) following record-linkage with birth registrations from the General Register Office. Multiple logistic regression modelling tested associations of workload with risk-adjusted process of CEFM and ISD neonatal outcome indicators.

**Subjects:** Eligible women and their infants delivered in participating units. CEFM data were available for 1559 eligible cases over the two-week audit period, and ISD neonatal outcome indicators for 3111 eligible infants (of 3489 infants or 85% of births registered) over the 4 week period of the workload observation.

**Results:** Midwifery workload information was complete for over 99% of 2576 observation periods, but less complete for medical staffing. Descriptive staffing results are presented in the SAPMEL final report.<sup>1</sup> Bigger units were consistently busier than smaller units. Using varying recommendations about midwifery staffing requirements there was evidence of staffing shortfall in Scottish labour wards between 15% and 38% of the time. When casemix and dependency of women were taken into account, bigger units experience higher workload as well as higher occupancy. There was no evidence of an association between increasing workload and adjusted process of CEFM, (eg. odds ratio 1.01 [0.9-1.1]), inappropriate CEFM (1.06 [0.9-1.24]), or lag time till medical response to a serious fetal heart trace abnormality (-6.7min [-21 min to 8.4 min]). There was no evidence of a significant association between falling workload, ie. increasing midwife staffing ratios and adjusted neonatal outcome (Apgar <7 at 5 minutes (0.83 [0.5-1.4]), or admission to neonatal unit (NNU) for >48 hours(0.76 [0.58-1.00])). However, there was a significant association between increasing midwife availability with lower odds of adjusted neonatal resuscitation (0.7 [0.5-0.9]), excluding bag and mask only.

**Interpretation.** This study described observed midwifery and medical staffing provision in Scottish labour wards. It explored methods of measuring dependency, casemix and workload in labour ward settings. Expert guidelines and recommendations for midwifery staffing levels vary. The direction of effect of increasing workload appears consistent and detrimental to quality of care and outcomes tested in this study, although the effect size may be small.