University of Basel
Faculty of Medicine
Department of Public Health

MaNtiS

Pflegewissenschaft
Nursing Science

Modelling midwifery and nurse staffing in a Swiss maternity clinic an analysis of longitudinal routine hospital data

L. C. Eggenschwiler[1,2], G. Moffa[3], V. Smith[4], M. Simon[1]

[1]Institute of Nursing Science, University of Basel, [2]Women's clinic, University Hospital Basel,
[3]Department of Mathematics and Computer Science, University of Basel, [4]School of Nursing & Midwifery, Trinity College Dublin

Background

- Staffing shortage of registered nurses and midwives are projected in Switzerland.
- No available recommendation on midwifery staffing in Switzerland.
- In addition, it is not clear how Swiss maternity wards are currently staffed.

Aim

- Modelling midwifery and nurse staffing for a maternity clinic of a Swiss university hospital in terms of care demand and care supply.

Methods

Single-centre retrospective observational longitudinal, time frame 2019 - 2022

Inpatient maternity care units – one prenatal unit, one labour ward, one postnatal unit

Routine hospital data - PEP®, discharge data and ORSOFT

Care supply – Total hours worked by registered midwives, registered nurses, nurse assistants

Care demand – Total hours care needed by birthing parents (length of stay in hours) and newborns (length of stay in hours * 0.5)

Supply-demand match – Total hours worked minus total hours care needed

$$Hours/_{8} = Number\ of\ midwives$$

Discussion

- **Care demand** to be further adjusted for complexity to enhance the understanding of demand.
- Current **staffing patterns** show potential to immediately improve staffing by adjusting for patterns like planned caesarean sections.
- Adapting **staff scheduling** based on the number of pregnant parents registered for birth per month might offer a further adjustment potential.
- Creative solutions are needed to address **supply-demand mismatches** while keeping working conditions attractive.

Results

- 10,458 births, 2,072 planned caesarean sections (~20%).
- 0 – 17 births per day indicate high demand variation.
- 14 days moving average of births per day indicates high variation.
- Yearly average around 7 births per day showing minor variation.

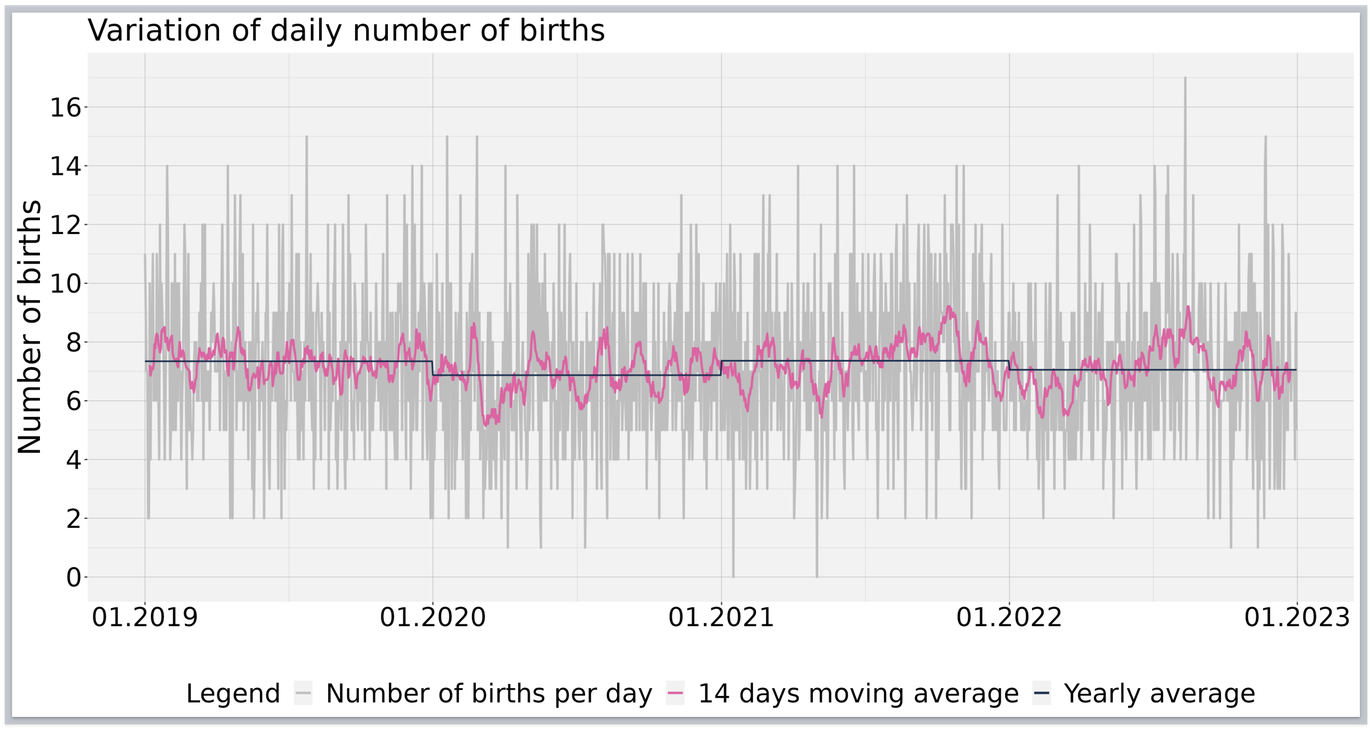

Figure 1. Variation of daily number of births. Presented in daily number of births, 14 days moving average and yearly average of daily number of births for the four-year time frame.

- 4,383 shifts, 44.1 hours of care supply (SD +/- 6.6 hours) on average per shift and 48.4 hours for care demand (SD +/- 17.1 hours).
- Supply-demand match resulted in -4.3 hours per shift (SD +/- 15.4 hours).
- Day shifts -8.0 hours (SD +/-15.9 hours), late shifts -0.4 hours (SD +/- 14.5 hours), and night shifts -4.5 hours (SD +/- 14.8 hours).

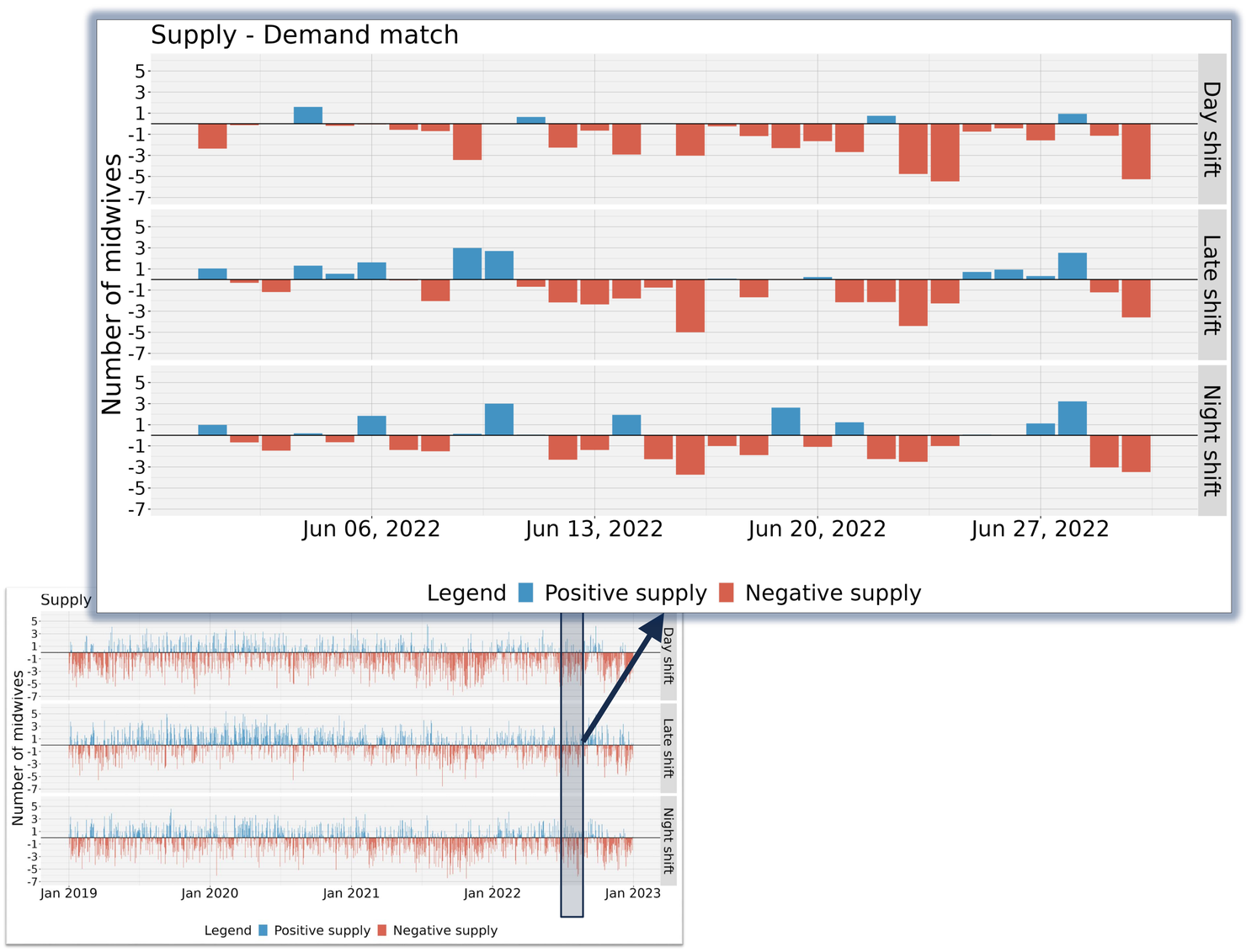

Figure 2. Supply-demand match on shift level for day, late and night shift. Full time frame and zoomed in time frame of one month. Number of midwives based on calculated hours of supply-demand match.

Swiss National Science Foundation

@l_eggens luisa.eggenschwiler@unibas.ch

Project-Website & References →