Evaluating neonatal morbidity using hospital discharge data: a systematic review.

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Background

► **Benchmarking newborn health across countries and hospitals** yields essential information about health system performance, but **requires common, comparable outcome indicators**.

►Hospital discharge data have the potential to describe neonatal morbidity at a low-cost.

Aims

► To ascertain which indicators of **neonatal morbidity constructed from routine hospital discharge data** have been used to investigate **newborn health outcomes in the published literature**, and how they were developed and validated.

► To focus on **composite indicators** which aim to measure the overall burden of neonatal morbidity in the short term (less than one year of life)

Methods

►**Study protocol in PROSPERO** website (CRD42017069145)

►Search strategy in *Figure 1*

►Eligibility criteria :
- observational studies
- using a composite indicator
- investigated neonatal morbidity
- based on routine hospital discharge data

Results

► **14 composite indicators** identified on 1,878 references (updated on April 13, 2018).

► Target populations in *Figure 2*

► All based on **ICD 9th or 10th** (diagnoses codes) ; 10 included also procedure codes.

►**7 groups of morbidity** defined :
- neurological pathology (n=13 / 14)
- respiratory pathology (n=12)
- shock and organ failure (n=10)
- birth trauma (n=9)
- infection (n=6)
- others (n=14)

►The 4 **indicators for high-risk infants were rather similar,** and at least 3 out of 4 included: necrotizing enterocolitis (NEC), interventricular hemorrhage (IVH), bronchopulmonary dysplasia (BPD) and retinopathy of prematurity (ROP).

► **Development process of indicators**:
- based on reviews of the literature (n=4)
- consensus with experts or users (n=3)

►No study compared the morbidity composite with medical records using the same sample.

► The prevalence varied from 4.6 to 9.0% for "all infants", 0.4 to 8.0% for "moderate and low risk infants" and 17.8 to 61.0% for high-risk infants.
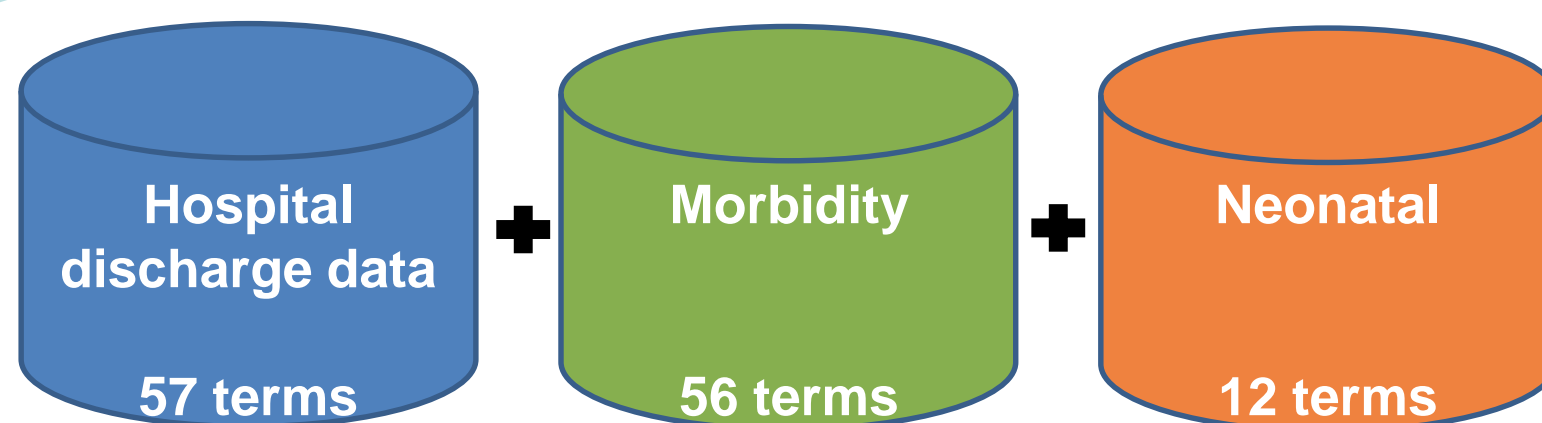

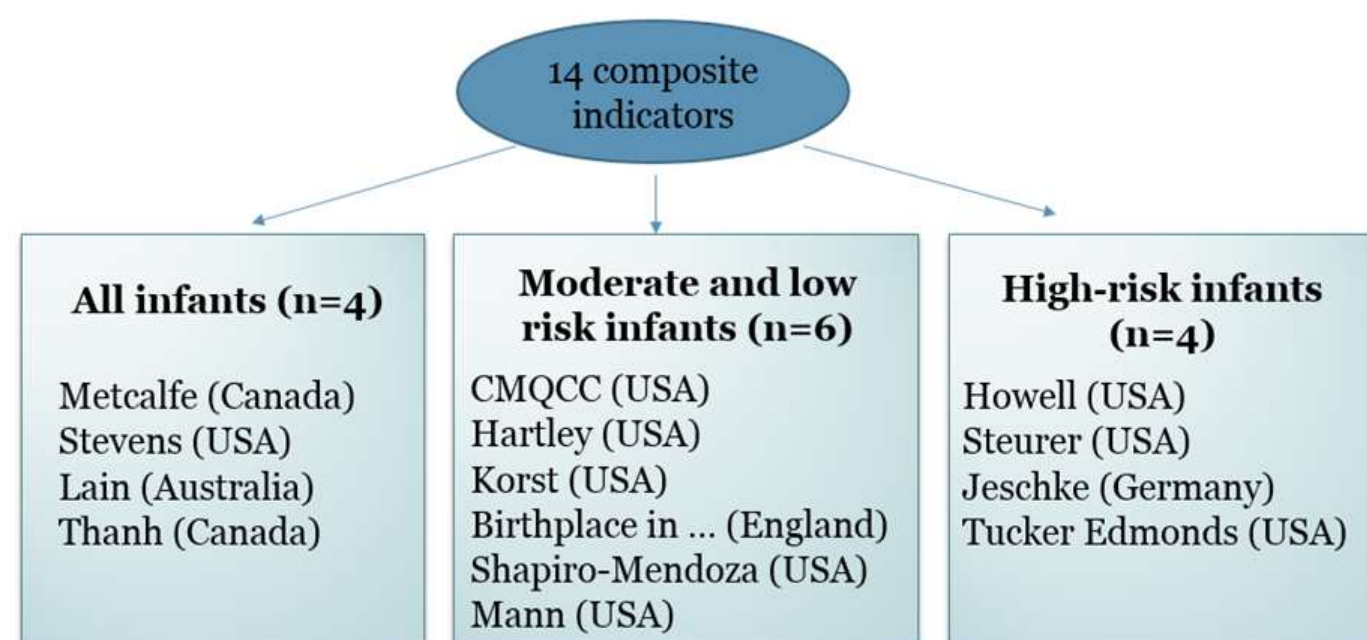
Figure 1: Search algorithm in PubMed

Figure 2: Target populations and geographic origins of the 14 composite indicators

Discussion / Conclusion

►Routine hospital data are not produced for research or epidemiological purposes.
►Lack of accurate description of morbidities
►With over-coding or under-coding problems
►**Multiple composite indicators based on hospital discharge data have been used in research on newborn health.**
►To develop a consensus on an indicator for use across institutional and geographical settings, research is needed to elucidate how **the choice of component morbidities and algorithms** affect the validity and comparability of morbidity estimates.

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