Medical Surveillance and Child Maltreatment (CM) Incidence Reporting among NICU Graduates

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Abstract

Objective: Identify and describe the risk profiles characterized by infant and maternal risk factors among maltreated neonatal intensive care unit (NICU) graduates and examine whether identified profiles are related to source of CM report .

Methods: Demographic, medical data including diagnoses and caregiving needs at discharge for infants treated in a NICU during 2005-2008 were obtained from the Neonatology databases. CM outcome data was obtained from child welfare databases. Latent class analysis procedures were used to identify homogenous mutually exclusive risk profiles (latent classes) among maltreated graduates (N=523). Logistic regression was used to examine the association between emergent risk profiles and source of CM report.

Results: Five risk profiles (subgroups) with different risk factor probability thresholds of known infant and maternal CM risk factors were identified among the maltreated children (N=523): low risk with adequate resources -10%, low risk with an experienced mother - 44%, low risk with an inexperienced mother -17%, high risk with an experienced mother - 9%, and high risk with an inexperienced mother - 20%. Based on a simple two latent class model, the latent class with high caregiving burden, preterm birth and low birth weight probabilities was a better predictor of healthcare provider related reports than the class with lower probabilities (Odds ratio: 2.72; 95% CI: 1.76-4.20).

Conclusions: The differences in the patterning of risk factors in identified risk profile groups suggest a need for multifactorial focused CM preventive efforts. The differential CM reporting thresholds of high risk infants among healthcare providers versus other community sentinels raises the question of whether increased attention to contextual maternal and family level risk factors or other post discharge factors (e.g. risk of delayed age appropriate developmental milestones) can aid or increase early identification of NICU infants at risk of CM.

Background

- Child maltreatment (CM) among medically fragile children is a consequence of multiple co-occurring infant and maternal risk factors.

- Infant and maternal CM risk factors often co-occur, are interrelated and differentially occur among babies born in the neonatal intensive care unit (NICU).

- The objective of this study was to:
  1. Identify and describe the risk profiles characterized by infant and maternal risk factors among maltreated NICU graduates

  2. Examine whether identified profiles were related to source of CM report (healthcare providers versus other community sentinels).

Methods

- Demographic, medical data including diagnoses at discharge for infants (N=523) treated in a NICU during 2005-2008 were obtained from the NICU databases .

- Child Maltreatment (CM) outcome data (1999-2012) was obtained from child welfare databases.

- Risk factors: gestational age- very low birth weight, caregiving burden, short NICU stay, maternal age, first time mother, Medicaid enrollment and previous child welfare involvement.

- Latent class analysis procedures were used to identify homogenous mutually exclusive risk profiles (latent classes) among maltreated NICU graduates.

- The appropriate number of risk profiles was determined using five criteria: (1) Bayesian Information Criteria (BIC), (2) Akaike Information Criterion (AIC), (3) Likelihood Ratio G^2 statistic (LR), (4) usefulness and (5) interpretability of latent classes.

- Logistic regression was used to examine the association between identified risk profiles and source of CM report (healthcare providers versus other community sentinels).

Results

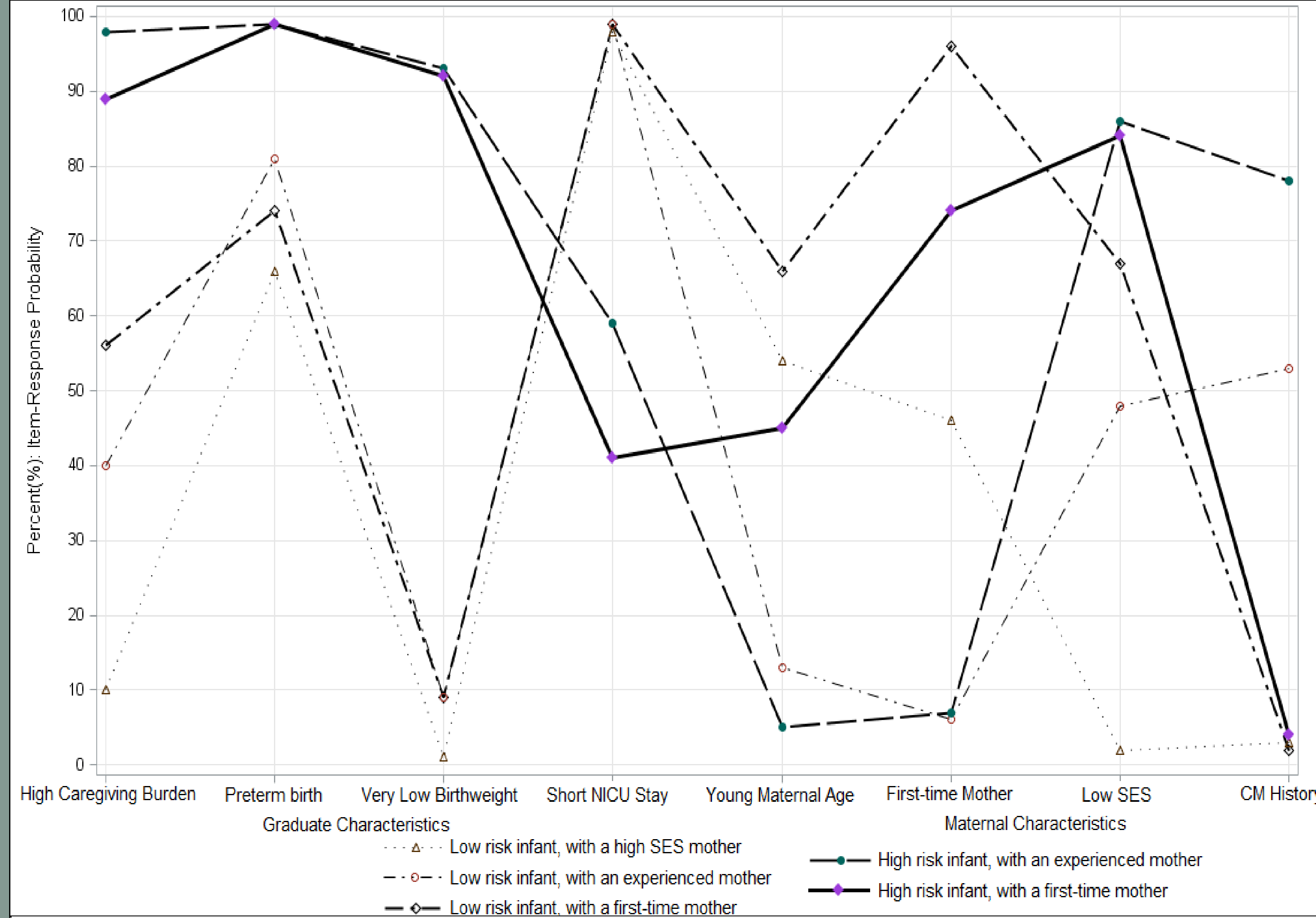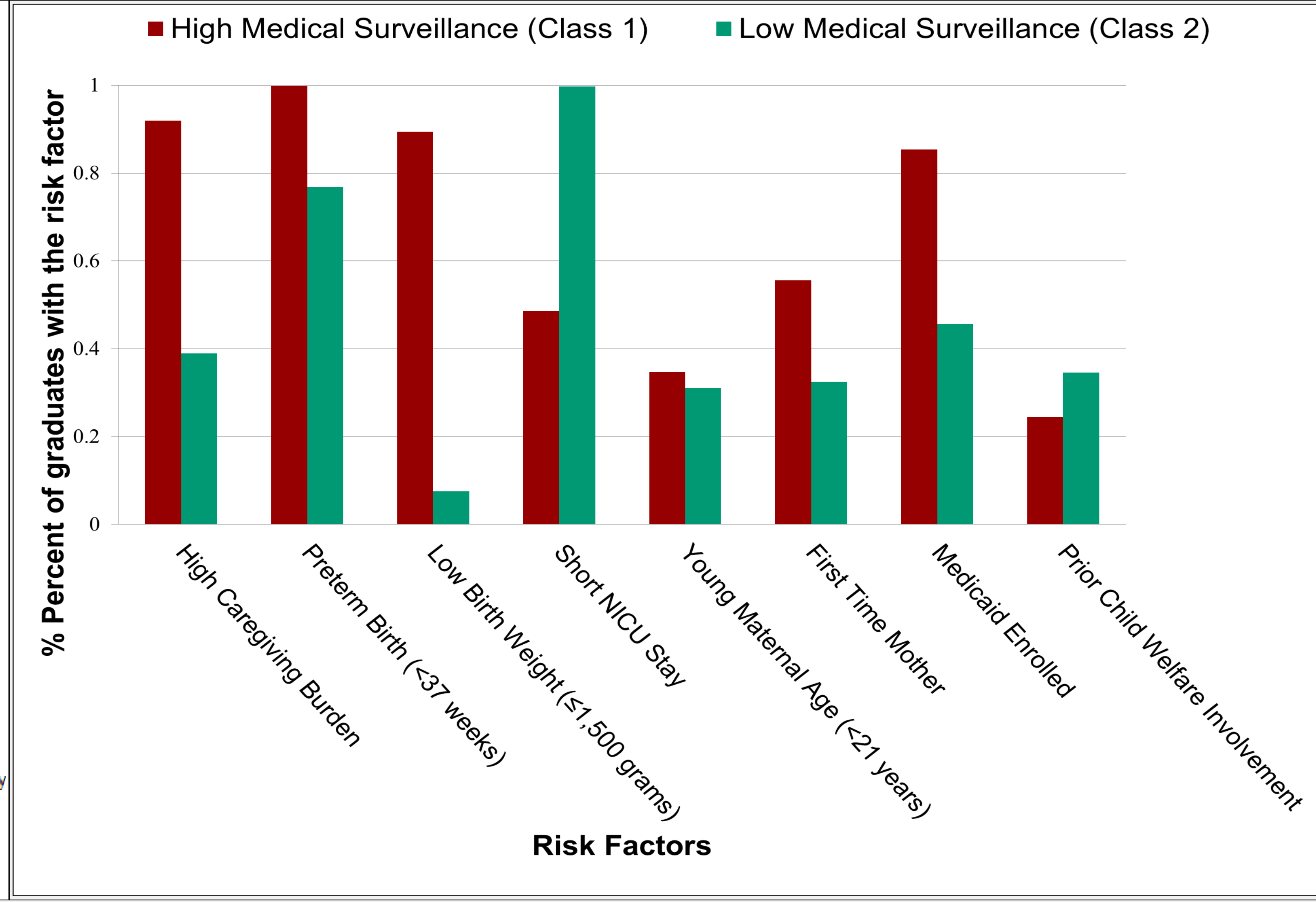**Fig 1.Probability of having a risk factor given a 5 Risk Profile Model**

Fig 2. Probability of having a risk factor given a 2 Risk Profile Model

- Five risk profiles were identified (N=523): low risk with adequate resources -10%, low risk with an experienced mother- 44%, low risk with an inexperienced mother -17%, high risk with an experienced mother - 9%, and high risk with an inexperienced mother - 20%.

- Based on a simple two latent class model, the class (1) with high caregiving burden, preterm birth and low birth weight probabilities was a better predictor of healthcare provider related reports than the class (2) with lower probabilities (OR: 2.72 ; 95%CI: 1.76-4.20).

Conclusions

- The differences in the patterning of risk factors in identified risk profile groups suggest a need for multifactorial focused CM preventive efforts. These efforts need to be tailored to address the different constellations of co-occurring risk factors that exist among medically fragile infants at risk of CM.

- The differential CM reporting thresholds of high risk infants among healthcare providers versus other community sentinels raises the question of whether increased attention to contextual maternal and family level risk factors or other post discharge factors (e.g. risk of delayed age appropriate developmental milestones) can aid or increase early identification of NICU infants at risk of CM.