

# Impact of the COVID-19 Pandemic on Late-Onset Sepsis Among Extremely Preterm Infants

NICHD  
NEONATAL RESEARCH NETWORK



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**Introduction**

- In response to the COVID-19 pandemic, neonatal units implemented enhanced infection-prevention practices to mitigate SARS-CoV-2 transmission.
- Such strategies could also impact bacterial late-onset sepsis (LOS) transmission.

**Objective**

- To compare LOS rates in extremely preterm infants in the NICHD Neonatal Research Network (NRN) sites before and during the COVID-19 pandemic.

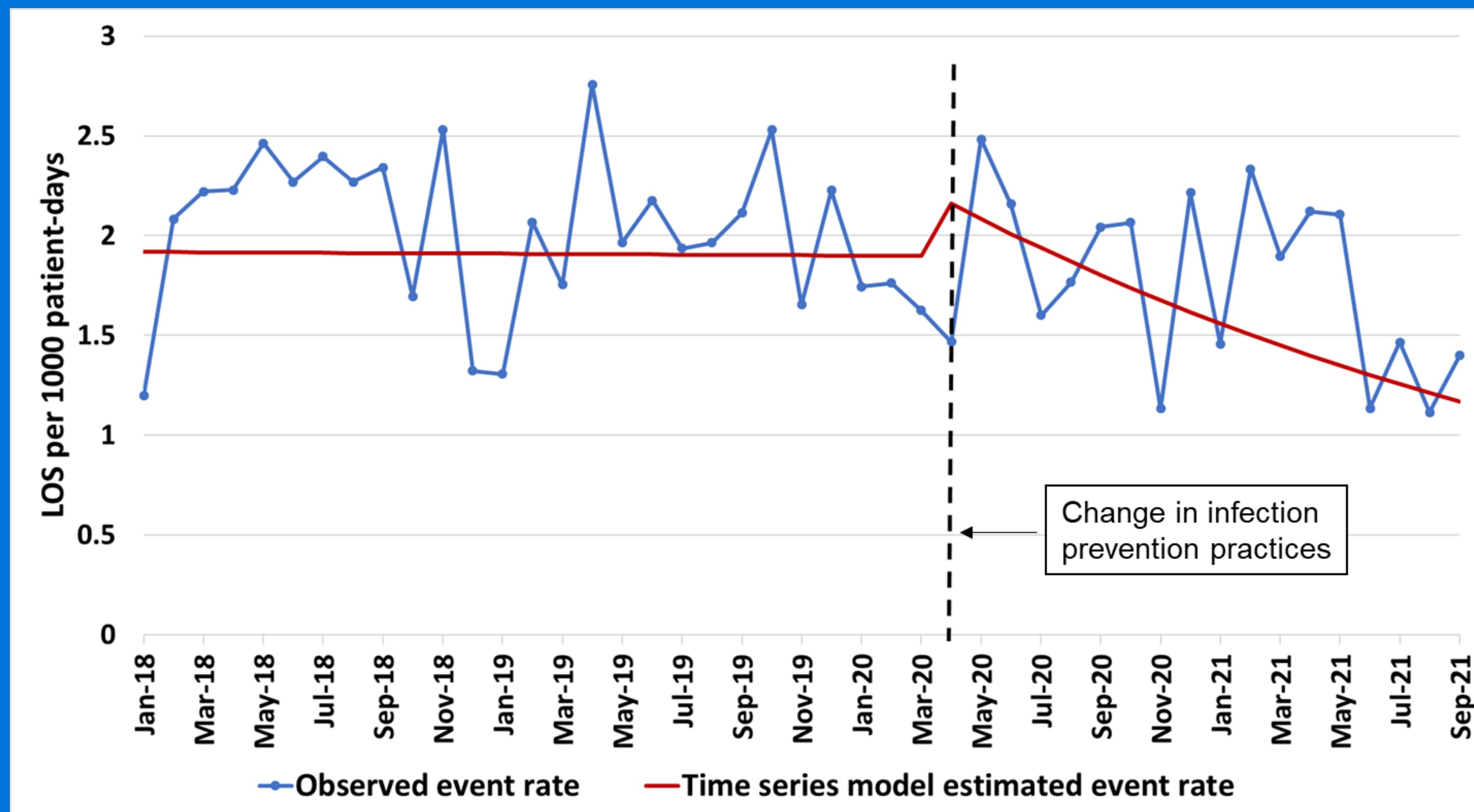
**Eligibility Criteria**

- Infants with birth weight 400-1000 grams or gestational age 22-28 weeks who survived >12 hours and were hospitalized at a NRN site from 1/1/18 to 8/31/21.

**Methods**

- Retrospective cohort study comparing the pre-pandemic period (1/1/18-3/31/20) and the pandemic period (4/1/20-8/31/21). April 1<sup>st</sup>, 2020 was chosen as the start of pandemic-associated infection-prevention practices.
- LOS was defined as a bacterial or fungal pathogen isolated from blood or CSF culture obtained >72 hours of age.
- Incidence rates (monthly LOS/1000 patient-days) and incidence proportion (LOS cases among all admissions) were the main outcomes.
- An interrupted time series analysis was used to analyze incidence rates.
- A multivariable Poisson regression model was used to determine LOS incidence proportion.
- All outcomes were measured during birth hospitalization

## Conclusion: LOS incidence rates per 1000 patient-days decreased during the pandemic



Estimates from the time-series model	Estimate	Standard Error	P-value
Intercept	0.652	0.116	<0.001
Baseline trend for outcome in pre-pandemic period <sup>a</sup>	-0.0004	0.006	0.95
Change in level for outcome at 4/1/2020 <sup>b</sup>	0.165	0.155	0.29
Change in trend for outcome after 4/1/2020 <sup>c</sup>	-0.036	0.013	0.008

Figure shows the actual (blue) and estimated (red) rates of monthly LOS/1000 patient-days during study period. Table shows the estimates from the time-series model adjusted for the centers as random effect. <sup>a</sup>There is no significant trend in rates of LOS prior to the pandemic. <sup>b</sup>There was no significant difference in incidence rates at the time of change. <sup>c</sup>Thereafter, there was a significant reduction in trend of incidence rates.

**Results**

- Fifteen centers, 6697 infants, and 642,842 patient-days were included.

**Table 1: LOS Incidence Proportion**

N (%)	Pre-Pandemic	Pandemic	P value
Early sepsis	113/4642 (2.43)	53/2040 (2.60)	0.69
LOS	821/4497 (18.3)	329/1947 (16.9)	0.19
CLABSI	250/4487(5.6)	108/1944(5.6)	0.98

Early sepsis – infection ≤ 72 hours after birth; CLABSI – central line associated blood stream infection

**Table 2: LOS Microbiology**

Total LOS episodes	Pre-Pandemic N=942	Pandemic N=383	P value
Gram positive (excluding CoNS)	213 (22.6)	87 (22.8)	0.95
Staphylococcus aureus	169 (17.9)	57 (14.9)	0.19
CoNS	347 (36.8)	139 (36.4)	0.89
Gram negative	244 (25.9)	106 (27.8)	0.48
Fungi	38 (4.0)	7 (1.8)	0.05
Polymicrobial	92 (9.8)	40 (10.5)	0.7

CoNS – coagulase negative staphylococci

**Table 3: Adjusted risk of LOS and death**

Adjusted outcomes	aRR (CI)	P value
Risk of LOS	0.92 (0.80-1.05)	0.23
Risk of LOS or death	1.02 (0.92-1.14)	0.71
Risk of death	1.14 (0.998-1.32)	0.08

Adjusted for gestational age, small for gestational age, male sex, race, maternal education, hypertension, chorioamnionitis and maternal antibiotics, C-section delivery, multiple births, necrotizing enterocolitis in ≤72 hours after birth, intraventricular hemorrhage ≤1 week after birth, antibiotics administered for ≥5 days starting ≤72 hours after birth, mechanical ventilation at 3 days age, days to enteral feed, admission temperature. Center included as a random effect. aRR – adjusted relative risk; CI – confidence interval

**Discussion**

Incidence proportion and incidence rates measure different aspects of LOS epidemiology. We found a significant reduction in the LOS incidence rates but no change in LOS incidence proportion. Longer study durations will identify if the downward trends in rate persist, and lead to reduced incidence proportions over time.



**Disclosures:** The authors have no financial relationships to disclose or conflicts of interest to resolve. Any real or apparent conflicts of interest related to the content of this poster have been resolved. This poster does not involve discussion of unapproved or off-label, experimental or investigational use of a drug.

**Acknowledgements:** The National Institutes of Health and the Eunice Kennedy Shriver National Institute of Child Health and Human Development provided grant support for the Neonatal Research Network. We are indebted to the infants and their parents who agreed to take part in this study and to our medical and nursing colleagues at: Brown University; Case Western Reserve University; Cincinnati Children's Hospital Medical Center; Duke University; Emory University; Nationwide Children's Hospital/Ohio State University, RTI International; Stanford University; University of Alabama at Birmingham; University of Iowa; University of New Mexico; University of Pennsylvania, University of Rochester; University of Texas Southwestern Medical Center; University of Texas Health Science Center at Houston; University of Utah.



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