

## Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.

**eTable 1.** ICD-10 Codes Used for Outcomes Not Defined in Text and Exclusion Criteria

Outcome/Exclusion	ICD-10
<b>Outcomes</b> SARS-CoV-2 positive Virus identified on PCR	U07.1
<b>Neurologic disorders</b> Hypoxic-ischemic encephalopathy 2-3 Neonatal convulsions	P91.6B, P91.6C P90.9A, P90.9B, P90.9C
<b>Respiratory complications</b> Meconium aspiration Congenital pneumonia	P24.0 P23
<b>Circulatory problems</b> Patent ductus arteriosus	Q25.0
<b>Exclusion criteria</b> Birth defect	Q00-Q24, Q25.1-Q25.9, Q26.0-Q99

**eTable 2.** Characteristics of Live Born Infants Experiencing In-Hospital Neonatal Mortality (n=7, Infants Delivered by Mothers Testing Positive for SARS-CoV-2 in Pregnancy Only)

	SARS-CoV-2 test-positivity in mother, days before delivery	Mother admitted for intensive care	Infant test-positive for SARS-CoV-2	Mode of delivery	Gestational age, weeks	Apgar scores at 1, 5 and 10 min	Survival in days	Neonatal diagnoses reported to the Swedish Neonatal Quality Register
Infant 1	3	No	No	Vaginal, non-instrumental	22	5, 8, 8	9	Extremely preterm birth, RDS, intraventricular hemorrhage, gut perforation
Infant 2	18	No	No	Emergency C-section	39	1, 1, 1	9	Severe birth asphyxia, hypoxic-ischemic encephalopathy, persistent pulmonary hypertension
Infant 3	-7	No	No	Emergency C-section	28	1, 3, 5	3	Very preterm birth, asphyxia, persistent pulmonary hypertension, pneumothorax
Infant 4	65	No	No	Vaginal, non-instrumental	26	missing, missing, 6	11	Extremely preterm birth, group B streptococcal septicemia, intraventricular and intracerebral hemorrhage
Infant 5	41	No	No	Emergency C-section	34	5, 6, 9	7	Mitochondrial myopathy, respiratory insufficiency, severe hypoxic-ischemic encephalopathy
Infant 6	74	No	No	Emergency C-section	39	1, 2, 7	7	Birth asphyxia, severe hypoxic-ischemic encephalopathy
Infant 7	70	No	No	Vaginal, non-instrumental	22	3, 4, 8	3	Extremely preterm birth, RDS, bilateral intraventricular hemorrhages grade 4

**eTable 3.** Mediation Analysis for Maternal SARS-CoV-2 Test-Status in Pregnancy and the Risk of Any Neonatal Respiratory Disease\*

Potential mediator	Odds ratio (95%CI)** in levels of mediator	Odds ratio (95%CI)**			Percentage mediated
		Total association	Direct association through maternal SARS-CoV-2	Indirect association through mediator	
Preterm birth					
Yes	1.35 (0.97-1.90)	1.35 (1.01-1.68)	1.04 (0.79-1.28)	1.30 (1.18-1.42)	89.3
No	0.80 (0.57-1.13)				
Preterm birth or cesarean section					
Yes	1.33 (1.03-1.72)	1.32 (1.02-1.62)	1.19 (0.93-1.45)	1.11 (1.05-1.17)	41.4
No	0.88 (0.57-1.37)				
Preterm birth or cesarean section or Apgar score at 5 min <4					
Yes	1.35 (1.05-1.75)	1.32 (1.02-1.63)	1.19 (0.93-1.45)	1.11 (1.05-1.18)	42.0
No	0.82 (0.52-1.30)				

\*Respiratory distress syndrome, Transient tachypnea of the newborn, Meconium aspiration, or Pneumonia.

\*\*Odds ratio in infants to mothers with SARS-CoV-2 positivity (n=2 323) vs infants to mothers with no SARS-CoV-2 test-positivity (n=9 275). Each exposed infant was matched on maternal characteristics with up to four comparators.

**eTable 4.** Characteristics of Infants Born in Sweden (March 11, 2020 – Jan 31, 2021) and Testing Positive for SARS-CoV-2 in the Neonatal Period (0-28 Days After Birth)

Test-positive infants to test-positive mothers	Gestational age, weeks	Admitted for Neonatal Care	Apgar scores at 1, 5 and 10 min	Length of stay in neonatal care, days	Diagnoses in addition to Neonatal SARS-Cov-2 positivity	Procedures/interventions
Infant 1-12	35 to <42	Never admitted	-	NA	None reported in the Swedish Neonatal Quality Register	None reported in the Swedish Neonatal Quality Register
Infant 13	37	Admitted a) at birth and b) day 5	9, 10, 10	a) 2 b) 5	a) Exposure to MRSA (carrier) and SARS-CoV-2, isolation b) Feeding difficulties	a) Monitoring of vital signs, screening
Infant 14	39	Admitted at birth	9, 9, 10	6	Clinical sepsis*	Chest X-ray (normal), tube feeding, antibiotics (7d)
Infant 15	40	Admitted at birth	6, 9, 9	4	Transient tachypnea	CPAP (1 d), chest X-ray (normal), tube feeding
Infant 16	39	Admitted at birth	9, 9, 10	4	Transient tachypnea	CPAP (1d), chest X-ray (normal), bottle feeding
Infant 17	28	Admitted at birth	5, 10, 10	81	Very preterm infant, small for gestational age, respiratory distress syndrome, patent ductus arteriosus, anemia	Mechanical ventilation (2d), CPAP (5d), parenteral nutrition, tube feeding, blood transfusion. No antibiotics.
Infant 18	34	Admitted at birth	1, 4, 8	4	Preterm infant, mild asphyxia, hypoglycemia	Ventilation at birth, tube feeding
Infant 19	30	Admitted at birth	2, 5, 7	39	Very preterm infant, mild asphyxia, respiratory distress syndrome,	Mechanical ventilation (2d), CPAP (7d), parenteral nutrition, antibiotics (4d).
Infant 20	39	Admitted at birth	9, 10, 10	1	Admission related to COVID-19, no other diagnosis reported	None reported in the Swedish Neonatal Quality Register
Infant 21	35	Admitted at birth	9, 10, 10	9	Admission related to COVID-19, no other diagnosis reported	None reported in the Swedish Neonatal Quality Register

**eTable 4 continued.** Characteristics of Infants Born in Sweden (March 11, 2020 – Jan 31, 2021) and Testing Positive for SARS-CoV-2 in the Neonatal Period (0-28 Days After Birth)

Test-positive infants to non test-positive mothers	Gestational age, weeks	Admitted for Neonatal Care	Apgar scores at 1, 5 and 10 min	Length of stay in neonatal care, days	Diagnoses in addition to Neonatal SARS-Cov-2 positivity	Procedures/interventions
Infants 1-37	35 to <42	Never admitted	-	NA	None reported in the Swedish Neonatal Quality Register	None reported in the Swedish Neonatal Quality Register
Infant 38	40	Admitted at birth	7, 8, 8	35	Paroxysmal supraventricular tachycardia (Wolf-Parkinson-White syndrome)	CPAP (2 d), chest X-ray (normal), tube feeding, ECG, pharmacological treatment
Infant 39	40	Admitted from home day 9	9, 10, 10	4d	Upper respiratory infection, feeding difficulties	Monitoring of vital signs
Infant 40	42	Admitted from home on day 23	9, 9, 10	3d	Admission related to COVID-19, no other diagnosis reported	Monitoring of vital signs
Infant 41	39	Admitted at birth	3, 8, 10	1d	Mild asphyxia, transient tachypnea	CPAP (1 d), chest X-ray (wet lung)
Infant 41	39	Admitted from home day 15	9, 8, 10	4d	Fever, isolation	Monitoring of vital signs, antibiotics (1d)
Infant 43	40	Admitted from home, day 21	9, 10, 10	2d	Unspecified condition	Antibiotics (2d)
Infant 44	41	Admitted at birth	9, 10, 10	10d	Transient tachypnea, patent ductus arteriosus, clinical sepsis*	CPAP (1d), chest X-ray (normal), bottle feeding, antibiotics (5d)
Infant 45	41	Admitted from home, day 12	8, 10, 10	1d	Fever	Monitoring

**eTable 4 continued.** Characteristics of Infants Born in Sweden (March 11, 2020 – Jan 31, 2021) and Testing Positive for SARS-CoV-2 in the Neonatal Period (0-28 Days After Birth)

Test-positive infants to <i>non test-positive</i> mothers, continued	Gestational age, weeks	Admitted for Neonatal Care	Apgar scores at 1, 5 and 10 min	Length of stay in neonatal care, days	Diagnoses in addition to Neonatal SARS-Cov-2 positivity	Procedures/interventions
Infant 46	41	Admitted from maternity unit, day 2	9, 10, 10	14d	Cutaneous bleedings, transient thrombocytopenia (unspecified)	Thrombocyte transfusion, cranial ultrasonography, monitoring of vital signs
Infant 47	32	Admitted at birth	9, 10, 10	16d	Preterm twin	CPAP (1d), tube feeding, monitoring of vital signs
Infant 48	32	Admitted at birth	8, 9, 9	16d	Preterm twin	CPAP (1d), tube feeding, monitoring of vital signs
Infant 49	37	Admitted from maternity unit, day 3	9, 10, 10	2d	Major malformation	Extra Oxygen (1d), Antibiotics (3d)

CPAP = Continuous positive airway pressure, ECG=Electrocardiogram; MRSA = methicillin resistant staphylococcus aureus.

\*Clinical sepsis is defined in the Swedish Neonatal Quality Register as: clinical symptoms AND laboratory indications of infection AND intravenous antibiotic therapy for at least 5 days AND negative blood culture.

**eTable 5.** Neonatal Outcomes of Infants Born in Sweden (March 11, 2020 – Jan 31, 2021) by SARS-CoV-2 Test-Status of Mother in Pregnancy, Restricting the Exposure Window for test-Positivity Among Pregnant Women From Conception to Delivery

Neonatal outcome	SARS-CoV-2 test status		Odds ratio (95%CI)
	Infants to positive women (n=2 249)	Matched infants to non-positive women (n=8 983)	
<b>Resuscitation at birth</b>			
Assisted ventilation (by mask or CPAP)	139 (6.2)	457 (5.1)	1.24 (1.01-1.51)
Intubated at birth	13 (0.6)	28 (0.3)	1.86 (0.96-3.59)
<b>Admission to neonatal unit</b>	251 (11.2)	751 (8.4)	1.40 (1.20-1.63)
Post-term infants ≥42 weeks of gestational age	6/39 (15.4)	16/258 (6.2)	-
Term (37-41 wks) or near-term (gestational age 35-36 wks) infants	161/2 124 (7.6)	568/8 552 (6.6)	-
Preterm infants <35 weeks of gestational age	84/86 (97.7)	167/173 (96.5)	-
Very preterm infants <32 weeks of gestational age	34/34 (100)	61/66 (92.4)	-
<b>Admission hypothermia (&lt;35.5°C), infants &lt;32 weeks of gestational age</b>	4/34 (11.8)	5/66 (7.6)	1.43 (1.10-1.85)
<b>Neurologic disorders</b>			
Hypoxic-ischemic encephalopathy 2-3	3 (0.1)	7 (0.1)	1.71 (0.44-6.63)
Neonatal convulsions	6 (0.3)	14 (0.2)	1.71 (0.66-4.46)
Severe brain injury (IVH3-4 or cPVL) in infants <32 weeks of gestational age	1/34 (2.9)	4/66 (6.1)	-
<b>Respiratory disorders and treatments</b>			
Respiratory distress syndrome	28 (1.2)	50 (0.6)	2.32 (1.44-3.73)
Transient tachypnea of the newborn	30 (1.3)	117 (1.3)	1.03 (0.68-1.54)
Meconium aspiration	3 (0.1)	13 (0.1)	0.92 (0.26-3.24)
CPAP	106 (4.7)	343 (3.8)	1.25 (1.00-1.57)
CPAP, duration in days			
Median (IQR)	2 (1-4)	2 (1-2)	
Range, min-max	1-78	1-101	
Mechanical ventilation	21 (0.9)	46 (0.5)	1.86 (1.10-3.14)
Mechanical ventilation, duration in days			
Median (IQR)	7 (3-8)	4 (2-8)	
Range, min-max	1-23	1-70	

Data are no. (%) if not stated otherwise.



**eTable 5 continued.** Neonatal Outcomes of Infants Born in Sweden (March 11, 2020 – Jan 31, 2021) by SARS-CoV-2 Test-Status of Mother in Pregnancy, Restricting the Exposure Window for test-Positivity Among Pregnant Women From Conception to Delivery

Neonatal outcome	SARS-CoV-2 test status		Odds ratio (95%CI)
	Infants to positive women (n=2 249)	Matched infants to non-positive women (n=8 983)	
Surfactant administration in infants <32 weeks of gestational age	14/34 (41.2)	28/66 (42.4)	-
Number of surfactant administrations			
Median (IQR)	1 (1-1)	1 (1-2)	
Range, min-max	1-4	1-4	
Postnatal corticosteroids (any systemic) for lung disease in infants <32 weeks of gestational age	2/34 (5.9)	7/66 (10.6)	-
Need of extra oxygen at 28 days of postnatal age in Infants <32 weeks of gestational age	0/34 (0)	3/66 (4.5)	-
Any respiratory disorder (RDS, TTN, MAS or pneumonia*)	61 (2.7)	184 (2.0)	1.34 (1.00-1.80)
<b>Circulatory problems</b>			
Persistent pulmonary hypertension	4 (0.2)	8 (0.1)	2.00 (0.60-6.64)
Patent ductus arteriosus in infants <32 weeks of gestational age	3/34 (8.8)	8/66 (12.1)	-
<b>Infections</b>			
Pneumonia*	3 (0.1)	8 (0.1)	1.50 (0.40-5.65)
Sepsis (verified by blood-culture)	4 (0.2)	7 (0.1)	2.29 (0.67-7.81)
Antibiotic therapy	61 (2.7)	186 (2.1)	1.33 (0.99-1.78)
<b>Metabolic or hematologic problems</b>			
Hypoglycemia	49 (2.2)	180 (2.0)	1.09 (0.79-1.51)
Treated hyperbilirubinemia	81 (3.6)	224 (2.5)	1.48 (1.14-1.92)
Blood transfusion	17 (0.8)	43 (0.5)	1.60 (0.90-2.84)
<b>Gastrointestinal disorder</b>			
Surgery for necrotizing enterocolitis in infants <32 weeks of gestational age	0/34 (0)	2/66 (3.0)	-
<b>In-hospital mortality</b>			
Overall	6 (0.27)	11 (0.12)	2.18 (0.81-5.90)
Gestational age <32 weeks	3/34 (8.8)	8/66 (12.1)	-

Data are no. (%) if not stated otherwise.

**eTable 5 continued.** Neonatal Outcomes of Infants Born in Sweden (March 11, 2020 – Jan 31, 2021) by SARS-CoV-2 Test-Status of Mother in Pregnancy, Restricting the Exposure Window for test-Positivity Among Pregnant Women From Conception to Delivery

Neonatal outcome	SARS-CoV-2 test status		Odds ratio (95%CI)
	Infants to positive women (n=2 249)	Matched infants to non-positive women (n=8 983)	
<b>Length of hospital stay in infants not admitted for neonatal care, days</b>			
Median (IQR)	2 (1-3)	2 (1-2)	
Range, min-max	0-24	0-19	
Missing – no. (%)	181 (8.0)	235 (2.6)	
<b>Length of hospital stay in infants admitted for neonatal care, days</b>			
Median (IQR)	3 (0-10)	5 (2-10)	
Range, min-max	0-107	0-119	
<b>Breastfeeding at discharge</b>			
Yes	1 827/1 933 (94.5)	7 635/8 027 (95.1)	0.84 (0.67-1.06)
No	106/1 933 (5.5)	392/8 027 (4.9)	1.19 (0.94-1.50)
Missing	316	956	
<b>Positive SARS-CoV-2 test in infant</b>			
<i>Reported to SmiNet</i>			
Early neonatal (0-6d)	12 (0.5)	0	
Late neonatal (7-28d)	2 (0.1)	4 (0.0)	
Post neonatal (>28d)	0	25 (0.3)	
At any postnatal age	14 (0.6)	29 (0.3)	

Data are no. (%) if not stated otherwise.

\*No infant with pneumonia tested positive for SARS-CoV-2.

CPAP= continuous positive airway pressure; cPVL= cystic periventricular leukomalacia; IQR= Interquartile range; IVH3-4= intraventricular hemorrhage grade 3 or 4; MAS=meconium aspiration syndrome; RDS=respiratory distress syndrome; SmiNet= Swedish Register for Communicable Diseases; TTN=transient tachypnea of the newborn; 95%CI= 95% confidence interval.