

SARS-CoV-2 COVID-19 & Pregnancy

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2009-2010
"Swine Flu"
Influenza AH1N1v

AH1N1 in pregnancy: review 3110 women from 29 countries

- Hospitalized 52.3% n =1625
- ICU 23.3% n=378
- Died 8% n=130
- 1% of population pregnant at any time but pregnant women
 - 6.3% hospital admissions
 - 5.9% ICU admissions
 - 5.7% deaths
- Risk factors for hospitalization
 - Age <20 y
 - Ethnicity
 - UK black and other minority ethnicities, Hispanic, Māori Aboriginal and Torres Strait Islanders
 - Obesity
 - Asthma
 - Smoking



Coronavirus
infections
SARS 2002
MERS 2012



Betacoronaviruses

SARS-CoV and MERS-CoV

Overall case fatality rate
10% and 40%

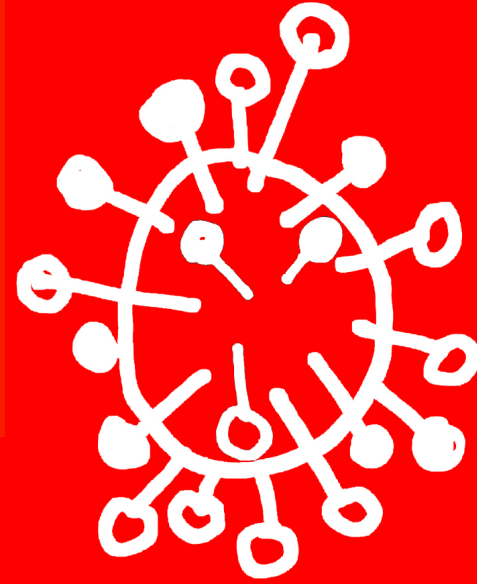
Pregnancy fatality rate
~25%



December 2019

Wuhan China

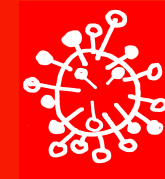
SARS-CoV-2



Globally **> 7 million** infections

> 400 000 deaths

- Are women who are pregnant more likely to be infected with SARS-CoV-2?
- Are women with SARS-CoV-2 who are pregnant more likely to become unwell?
- What are the risk factors for severe illness due to SARS-CoV-2 in women who are pregnant?
- What are the maternal and fetal implications of SARS-CoV-2 infection?
 - Evidence of vertical transmission?
- Is breast feeding safe?
- Should all pregnant women admitted to hospital be tested for SARS-CoV-2?



SARS-CoV-2 COVID-19 & PREGNANCY

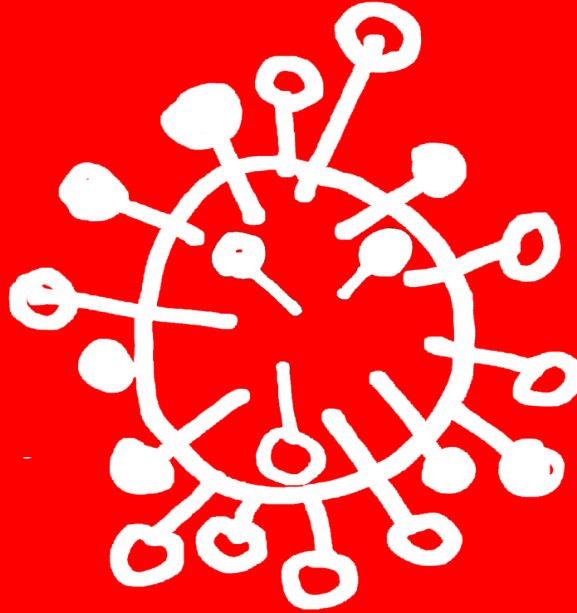
Sars-CoV-2 and
COVID-19 in
pregnancy



Wuhan, China Dec 2019-March 2020

- 118 women with COVID-19
 - Median age 31 y
 - 64% 3rd trimester
 - Mild disease 92% (n=109)
 - Severe disease 8% (n=9)
 - No deaths
- N=68 delivered
 - 93% CS
 - Premature 21% (n=14)
 - No neonatal SARS-CoV-2 infection or death

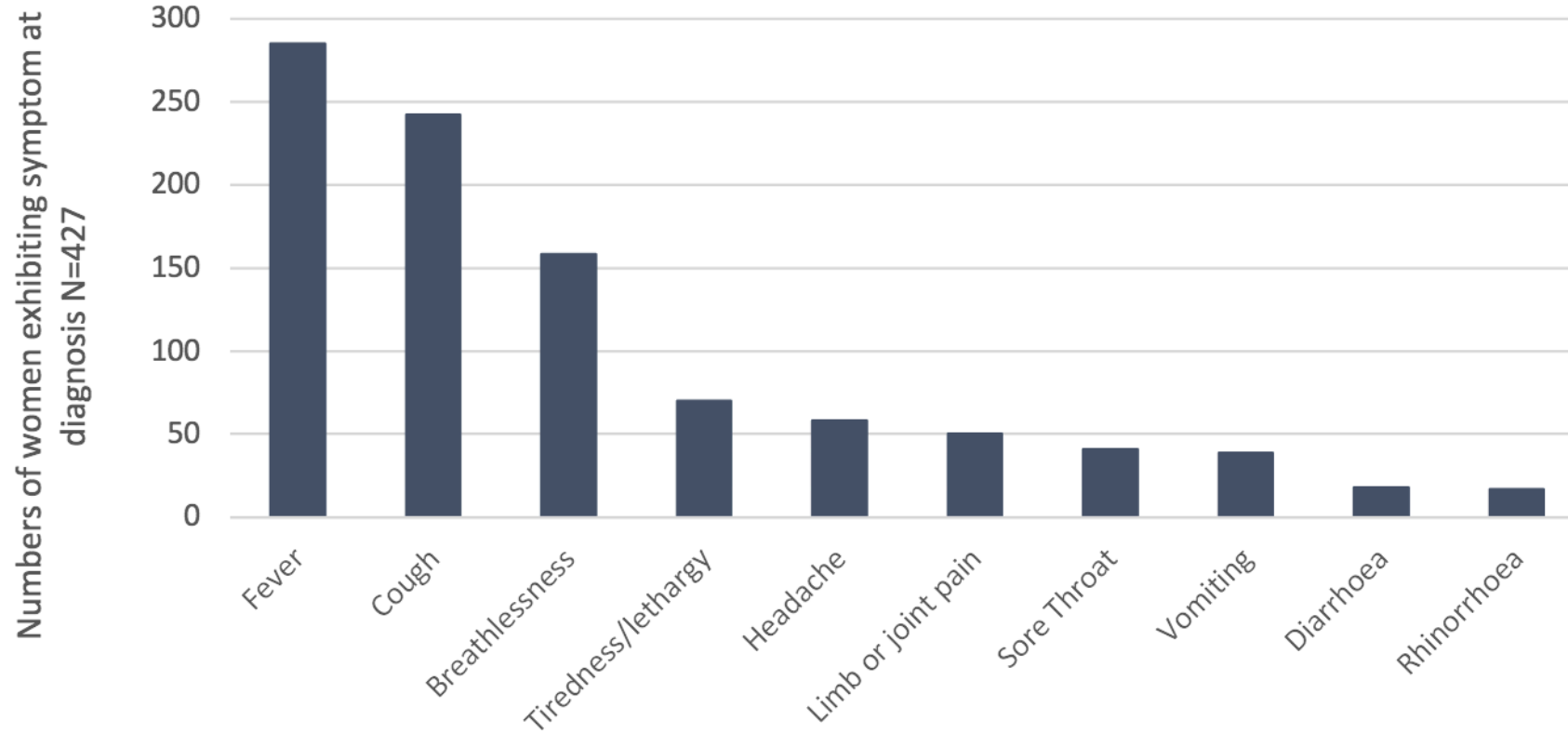
UK data SARS-CoV-2 in pregnancy




~1 in 200 maternities

*Knight et al BMJ 2020 June doi:
10.1101/2020.05.08.20089268*

- UKOSS population-based consultant-led maternity units n=194
- Pregnant women admitted to hospital (1/3-14/4/20) with **confirmed SARS-CoV-2 RNA or COVID-19 pneumonitis** (only symptomatic women tested)
- Confirmed cases **n = 427**: **4.9/1000** maternities (95%CI 4.5-5.4)



81% symptomatic in 3rd trimester


	N (%)	Incidence /1000 maternities	Rate ratio (95%CI)
Age <25 y	4	1.6	0.4 (0.1-1.1)
Age 25-34 y	248 (41)	3.9	1 (ref)
Age >35 y	175 (41)	8.8	2.3 (1.8-2.7)
Normal (BMI <25 kg/m ²)	126	3.5	1 (ref)
Overweight (BMI 25-<30 kg/m ²)	141 (35)	6.8	2.0 (1.5-2.5)
Obese (BMI >30 kg/m ²)	140 (34)	8.7	2.5 (2.0-3.2)


Pre-existing medical condition n=145 (34%)


Asthma n=31 (7%)

Hypertension n=12 (3%)

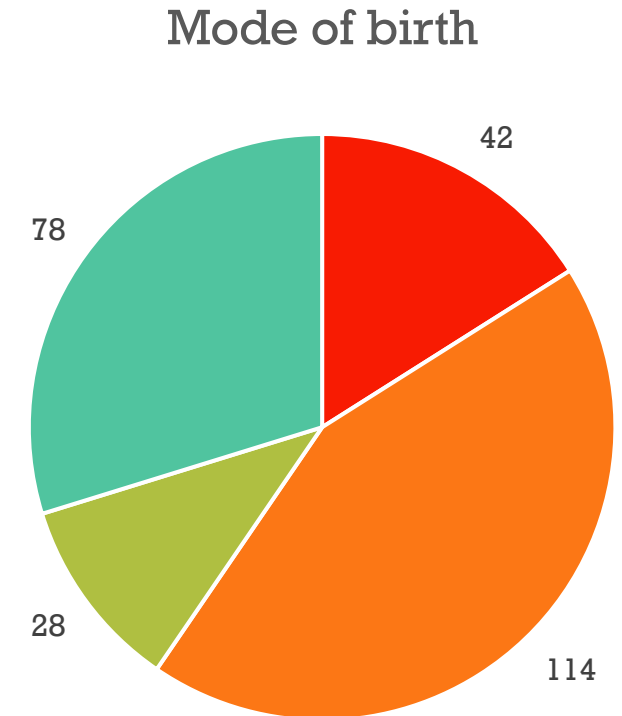
Diabetes n=13 (3%)

Ethnicity 	N (%)	Incidence /1000 maternities	Rate ratio (95%CI)
White	173	3.5	1
Black	89	28.4	8.1 (6.2-10.5)
Asian	103	13.9	4.0 (3.1-5.1)
Chinese/other	28	9.5	2.7 (1.7-4.0)
Mixed	9	6.9	2.0 (0.9-3.8)

Maternal outcomes 	N (%)
Critical care required	41 (9.6)
Extra-corporeal membrane oxygenation	4 (1)
Died	5 (1.2)
COVID-19 pneumonia on imaging	104 (24)
Discharged well	397 (93)
Still in hospital	25 (6)

Pregnancy outcomes 	N (%)
Ongoing pregnancy	161 (38)
Pregnancy completed	266 (62)
Stillbirth	3 (1)
Live birth	259 (97)
Neonatal death	2 (1)
Gestation at end of pregnancy	
≥37 w	194 (74)
32-36 w	43 (16)
<32 w	27 (10)

Median gestation at birth 38 w



■ Caesarean due to SARS-CoV-2 ■ Caesarean, other indication
 ■ Operative vaginal birth ■ Unassisted vaginal birth

**General anesthetic for CS n=28 (20%)
 intubated for maternal compromise n=18
 intubated for urgent delivery n=10**

Neonatal outcome



- **NICU admission n=67/265 (25%)**
 - Preterm <37 w n=50
 - <32 w n=23
- **Neonates positive viral RNA**
 - <12 h birth 2% (n=6)
 - Unassisted vaginal birth n=2
 - CS n=4 - 3 pre-labour
 - Admitted to NICU n=1
 - ≥12 h birth 2% (n=6)
 - Pre-labour CS n=4
 - Vaginal birth n=2
 - Admitted to NICU n=5

Vertical Transmission?



- SARS-CoV-2 IgM ab in neonates
 - negative nasopharyngeal swabs
- 32 women with COVID-19 in NY USA
- 11 placental or membrane swabs
- 3 positive for SARS-CoV-2
 - All delivered by CS, severe or critically unwell
 - Origin of SARS-CoV-2 detected uncertain
- No infant positive for SARS-CoV-2



Viral transfer to breast milk uncertain but unlikely

Presumed, possible or confirmed infection

Careful hand hygiene

Wear cloth mask when breast feeding or
expressing

Manhattan NY March 22-April 4 2020¹

215 births in 2 hospitals

Screened for symptoms COVID-19

Yes Sx n=4 (1.9%) **100% SARS-CoV-2 positive**

No Sx n=211: SARS-CoV-2 positive n=29 (**13.7%**)

Connecticut April 2020: 3 hospitals²

770 women tested for SARS-CoV-2 on admission

Overall **positive 3.9% (n=30)**

Symptomatic (n=14)

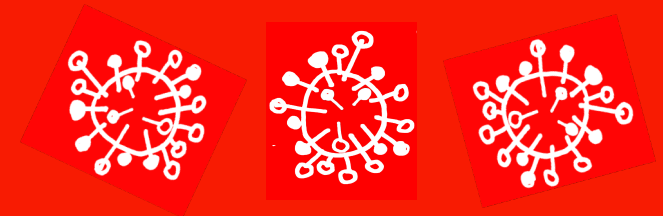
positive 57.1% (n=8/14)

Asymptomatic (n=756)

positive 2.9% (n=22/756)

**No symptoms at admission in 88% and 73%
of women positive for SARS-CoV-2**

Screening for
all pregnant
women?



¹Sutton et al NEJM doi: 10.1056/nejmc2009316

²Campbell et al JAMA
doi:10.1001/jama.2020.8904



Questions about SARS-CoV-2 and COVID-19 in pregnancy



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