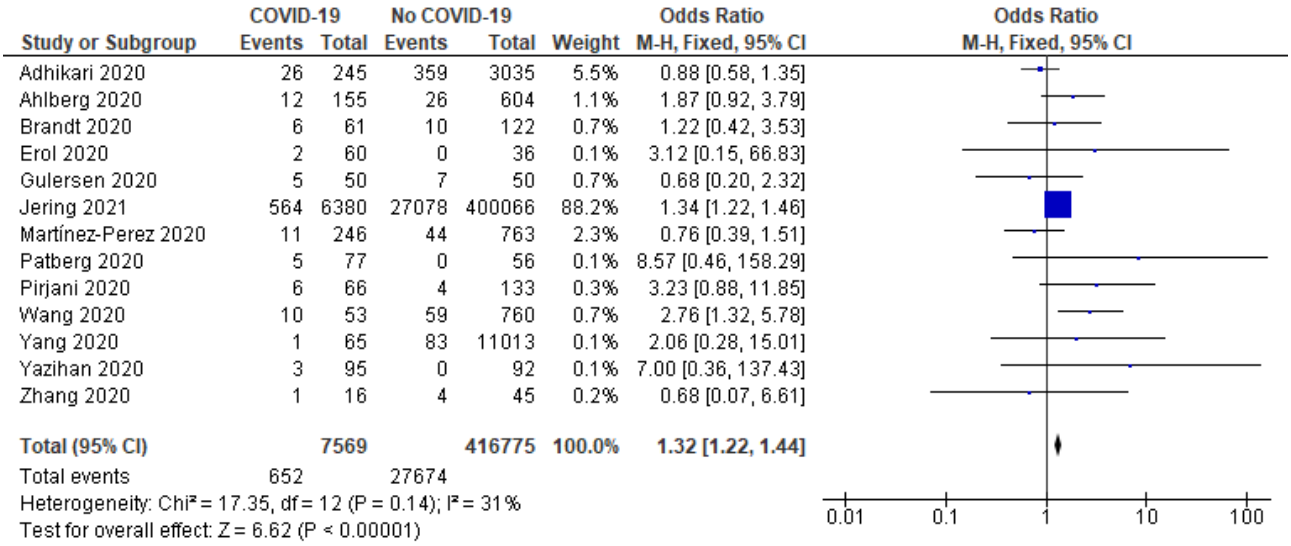
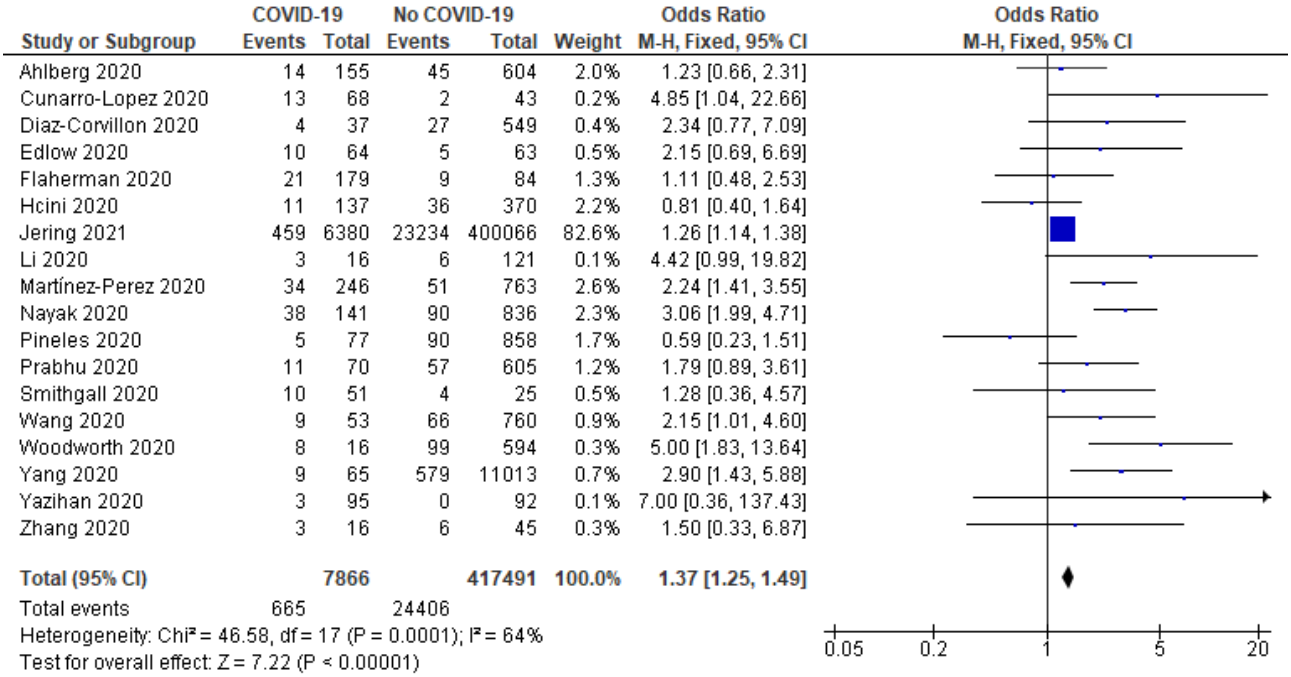
Appendix 5. Association between COVID-19 and pregnancy outcomes for studies with small sample size (n<100 in each group) using fix-effect models

5.1 COVID-19 vs no COVID-19

5.1.1 Association between COVID-19 and preeclampsia



5.1.2 Association between COVID-19 and preterm birth



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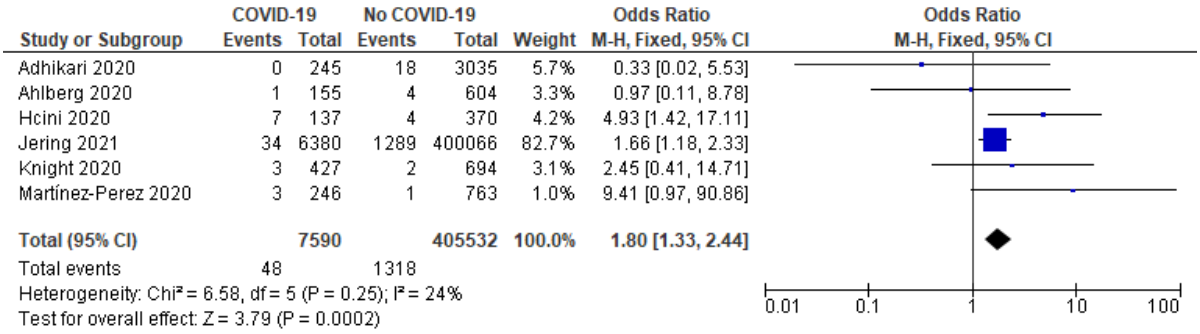
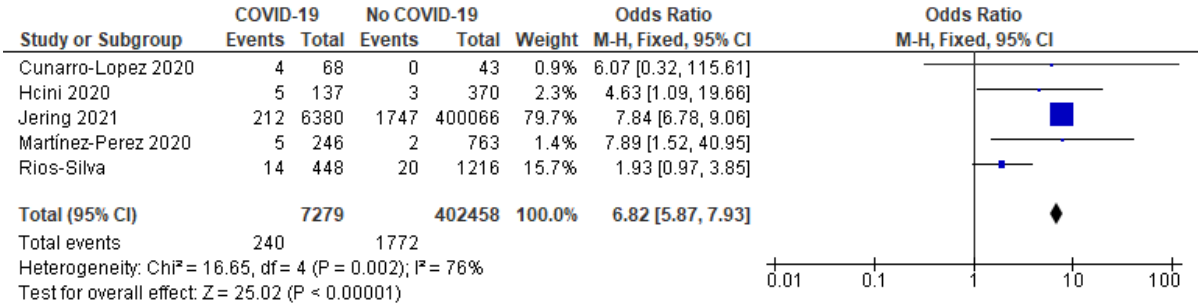
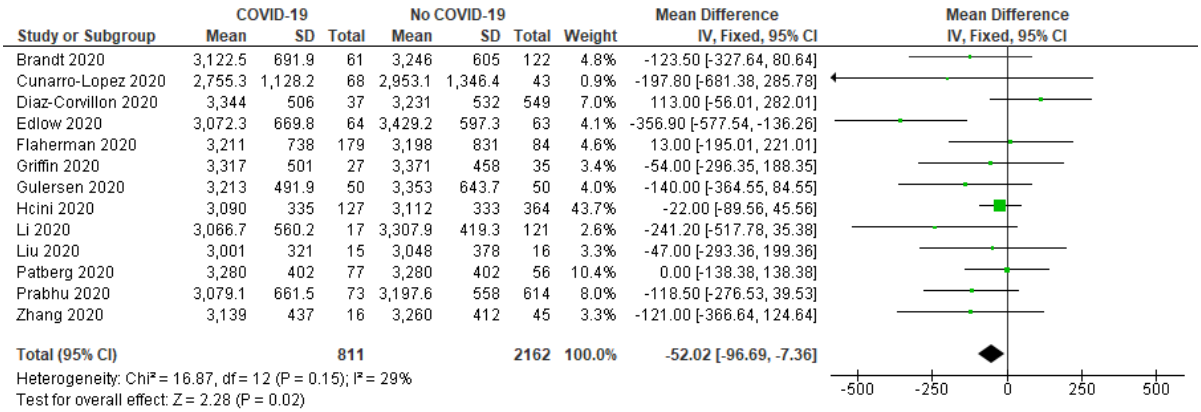
5.1.3 Association between COVID-19 and stillbirth



5.1.4 Association between COVID-19 and intensive care unit (ICU) admission



5.1.5 Association between COVID-19 and birth weight (grams)



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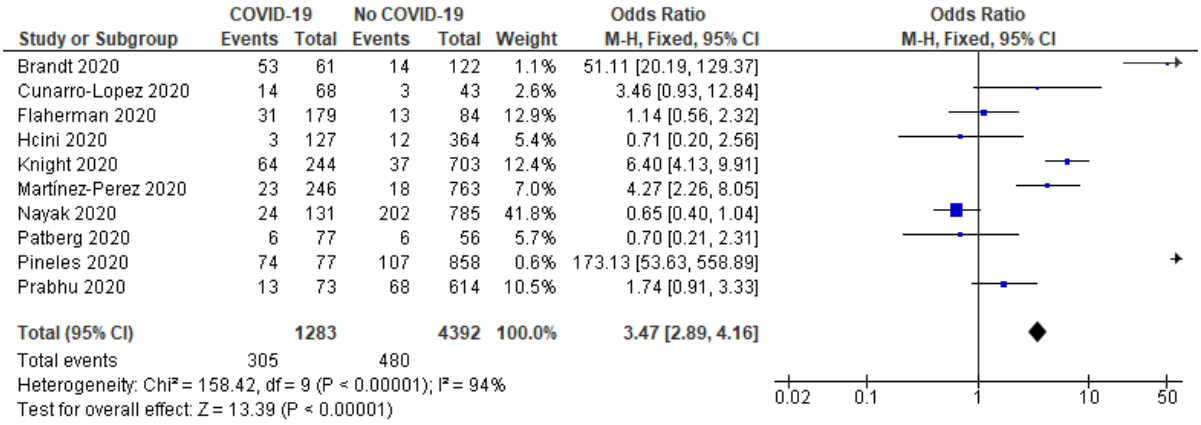
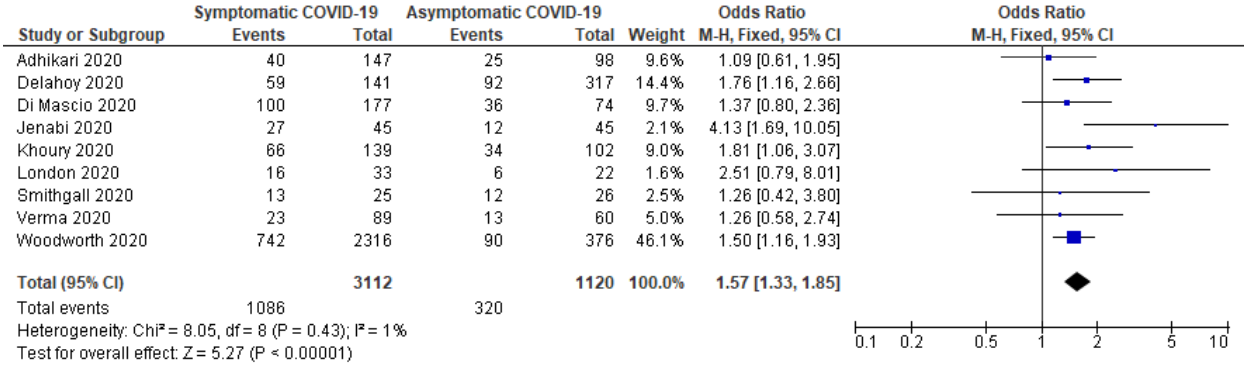
5.1.6 Association between COVID-19 and neonatal intensive care unit (NICU) admission

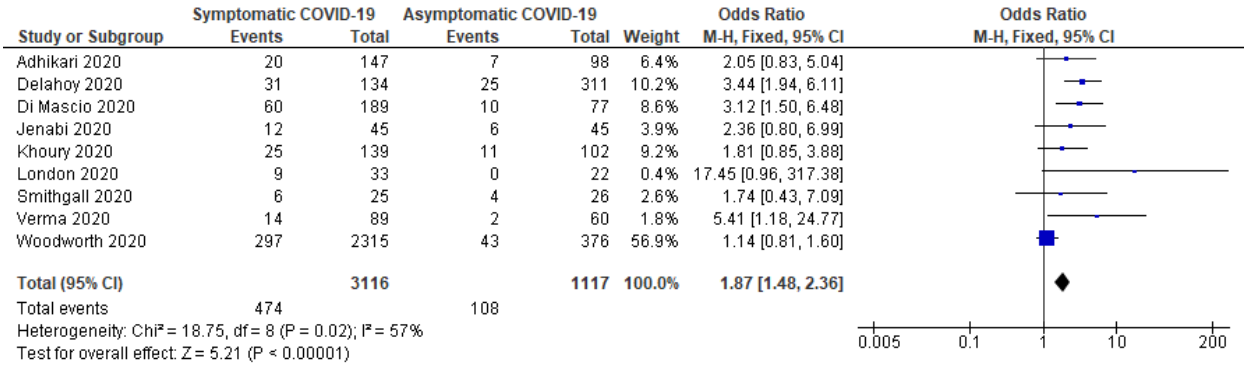


5.2 Symptomatic COVID-19 vs asymptomatic COVID-19

5.2.1 Association between symptomatic COVID-19 and cesarean delivery



5.2.2 Association between symptomatic COVID-19 and preterm birth



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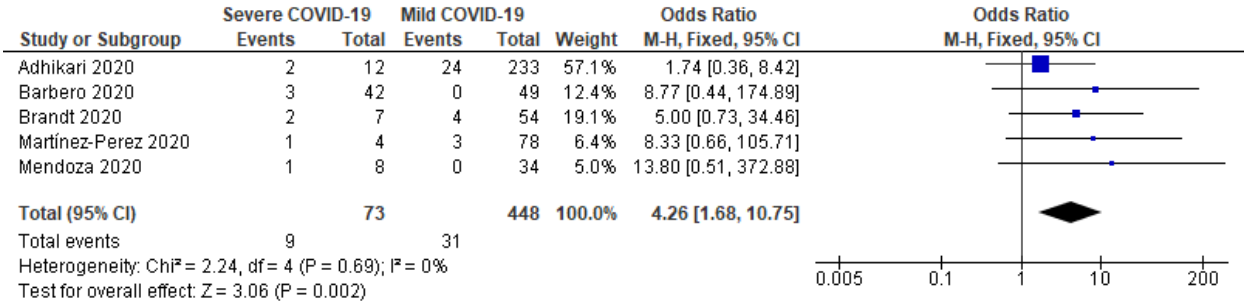
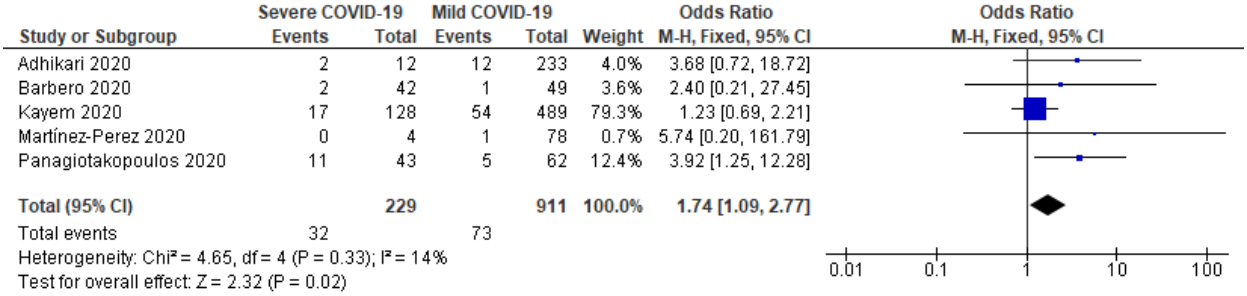
5.3 Severe COVID-19 vs mild COVID-19

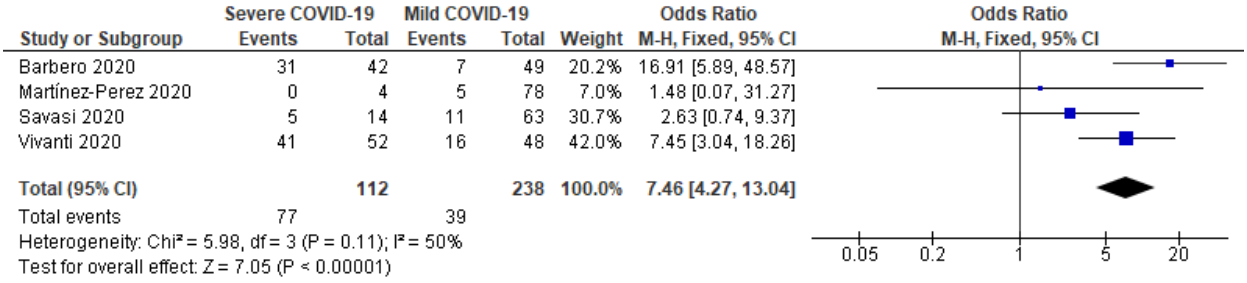
5.3.1. Association of severe COVID-19 with preeclampsia



5.3.2. Association of severe COVID-19 with gestational diabetes



5.3.3. Association of severe COVID-19 with abnormal liver function

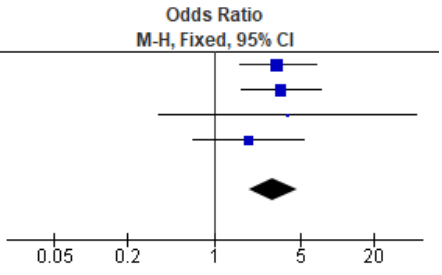


Appendix 5, as supplied by the authors. Appendix to: Wei SQ, Bilodeau-Bertrand M, Liu S, et al. The impact of COVID-19 on pregnancy outcomes: a systematic review and meta-analysis. *CMAJ* 2021. doi: 10.1503/cmaj.202604. Copyright © 2021 The Author(s) or their employer(s). To receive this resource in an accessible format, please contact us at cmajgroup@cmaj.ca.

5.3.4. Association of severe COVID-19 with lymphopenia

Study or Subgroup	Severe COVID-19 Events	Severe COVID-19 Total	Mild COVID-19 Events	Mild COVID-19 Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Di Mascio 2020	26	39	86	227	38.6%	3.28 [1.60, 6.72]
Maraschini 2020	33	47	40	99	35.2%	3.48 [1.65, 7.31]
Martínez-Perez 2020	1	4	6	78	2.0%	4.00 [0.36, 44.60]
Vivanti 2020	21	43	8	24	24.1%	1.91 [0.68, 5.39]
Total (95% CI)		**133**		**428**	**100.0%**	**3.03 [1.93, 4.78]**
Total events	81		140			

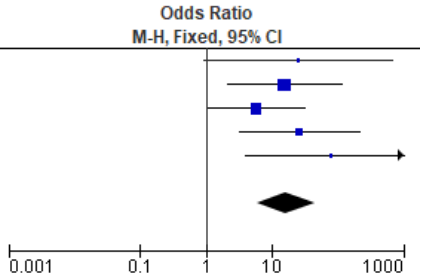
Heterogeneity: Chi² = 0.99, df = 3 (P = 0.80); I² = 0%
Test for overall effect: Z = 4.79 (P < 0.00001)



5.3.5. Association of severe COVID-19 with intensive care unit (ICU) admission

Study or Subgroup	Severe COVID-19 Events	Severe COVID-19 Total	Mild COVID-19 Events	Mild COVID-19 Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Brandt 2020	1	7	0	54	3.2%	25.15 [0.93, 683.58]
Di Mascio 2020	42	294	1	94	40.2%	15.50 [2.10, 114.23]
Maraschini 2020	5	47	2	99	35.6%	5.77 [1.08, 30.96]
Panagiotakopoulos 2020	13	43	1	62	17.7%	26.43 [3.30, 211.67]
Savasi 2020	5	11	0	46	3.4%	78.69 [3.88, 1595.10]
Total (95% CI)		**402**		**355**	**100.0%**	**16.43 [5.86, 46.04]**
Total events	66		4			

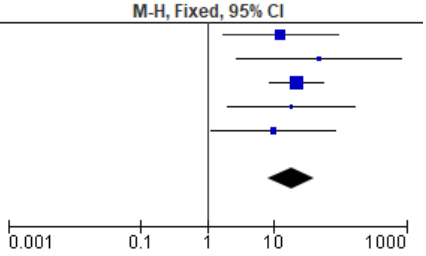
Heterogeneity: Chi² = 2.80, df = 4 (P = 0.59); I² = 0%
Test for overall effect: Z = 5.32 (P < 0.00001)



5.3.6. Association of severe COVID-19 with mechanical ventilation

Study or Subgroup	Severe COVID-19 Events	Severe COVID-19 Total	Mild COVID-19 Events	Mild COVID-19 Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Di Mascio 2020	35	294	1	94	31.3%	12.57 [1.70, 93.03]
Khoury 2020	9	75	0	166	6.4%	47.57 [2.73, 829.00]
Maraschini 2020	31	47	8	99	41.1%	22.04 [8.60, 56.50]
Martínez-Perez 2020	2	4	4	78	4.6%	18.50 [2.04, 167.48]
Panagiotakopoulos 2020	6	43	1	62	16.5%	9.89 [1.15, 85.43]
Total (95% CI)		**463**		**499**	**100.0%**	**18.54 [8.22, 41.82]**
Total events	83		14			

Heterogeneity: Chi² = 1.02, df = 4 (P = 0.91); I² = 0%
Test for overall effect: Z = 7.04 (P < 0.00001)



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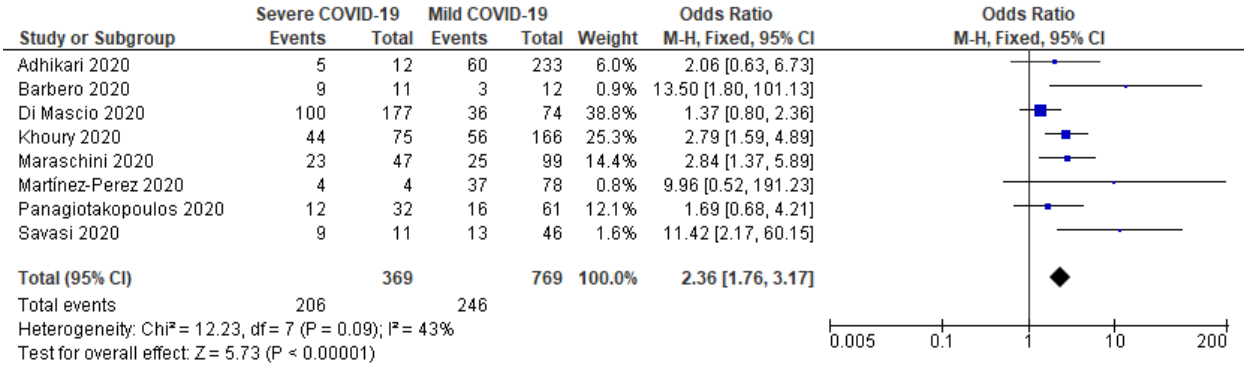
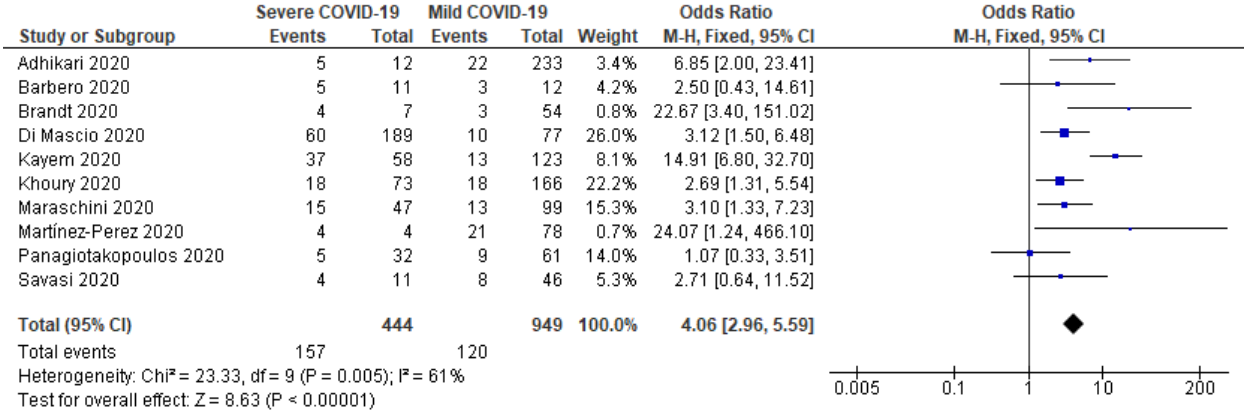
5.3.7. Association of severe COVID-19 with cesarean delivery



Study or Subgroup	Severe COVID-19 Events	Severe COVID-19 Total	Mild COVID-19 Events	Mild COVID-19 Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Adhikari 2020	5	12	60	233	6.0%	2.06 [0.63, 6.73]
Barbero 2020	9	11	3	12	0.9%	13.50 [1.80, 101.13]
Di Mascio 2020	100	177	36	74	38.8%	1.37 [0.80, 2.36]
Khoury 2020	44	75	56	166	25.3%	2.79 [1.59, 4.89]
Maraschini 2020	23	47	25	99	14.4%	2.84 [1.37, 5.89]
Martínez-Perez 2020	4	4	37	78	0.8%	9.96 [0.52, 191.23]
Panagiotakopoulos 2020	12	32	16	61	12.1%	1.69 [0.68, 4.21]
Savasi 2020	9	11	13	46	1.6%	11.42 [2.17, 60.15]
Total (95% CI)		**369**		**769**	**100.0%**	**2.36 [1.76, 3.17]**
Total events	206		246			

Heterogeneity: Chi² = 12.23, df = 7 (P = 0.09); I² = 43%
Test for overall effect: Z = 5.73 (P < 0.00001)

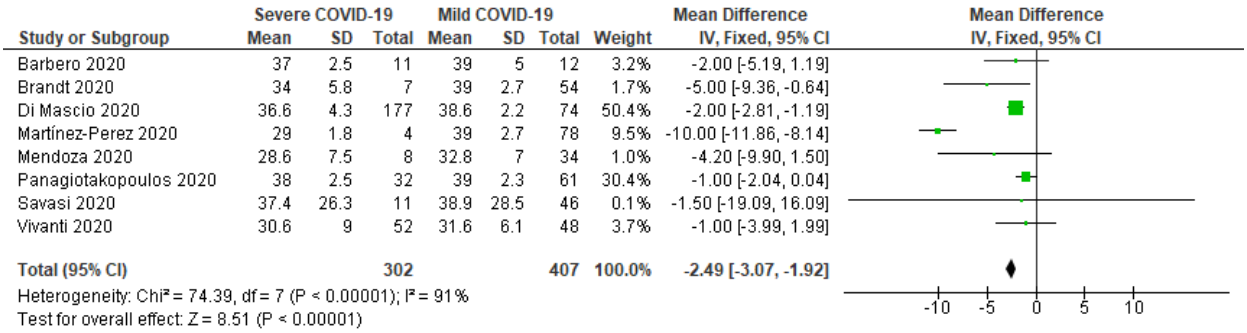
5.3.8. Association of severe COVID-19 with preterm birth



Study or Subgroup	Severe COVID-19 Events	Severe COVID-19 Total	Mild COVID-19 Events	Mild COVID-19 Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Adhikari 2020	5	12	22	233	3.4%	6.85 [2.00, 23.41]
Barbero 2020	5	11	3	12	4.2%	2.50 [0.43, 14.61]
Brandt 2020	4	7	3	54	0.8%	22.67 [3.40, 151.02]
Di Mascio 2020	60	189	10	77	26.0%	3.12 [1.50, 6.48]
Kayem 2020	37	58	13	123	8.1%	14.91 [6.80, 32.70]
Khoury 2020	18	73	18	166	22.2%	2.69 [1.31, 5.54]
Maraschini 2020	15	47	13	99	15.3%	3.10 [1.33, 7.23]
Martínez-Perez 2020	4	4	21	78	0.7%	24.07 [1.24, 466.10]
Panagiotakopoulos 2020	5	32	9	61	14.0%	1.07 [0.33, 3.51]
Savasi 2020	4	11	8	46	5.3%	2.71 [0.64, 11.52]
Total (95% CI)		**444**		**949**	**100.0%**	**4.06 [2.96, 5.59]**
Total events	157		120			

Heterogeneity: Chi² = 23.33, df = 9 (P = 0.005); I² = 61%
Test for overall effect: Z = 8.63 (P < 0.00001)

5.3.9. Association of severe COVID-19 with gestational age at birth (weeks)



Study or Subgroup	Severe COVID-19 Mean	Severe COVID-19 SD	Severe COVID-19 Total	Mild COVID-19 Mean	Mild COVID-19 SD	Mild COVID-19 Total	Weight	Mean Difference IV, Fixed, 95% CI
Barbero 2020	37	2.5	11	39	5	12	3.2%	-2.00 [-5.19, 1.19]
Brandt 2020	34	5.8	7	39	2.7	54	1.7%	-5.00 [-9.36, -0.64]
Di Mascio 2020	36.6	4.3	177	38.6	2.2	74	50.4%	-2.00 [-2.81, -1.19]
Martínez-Perez 2020	29	1.8	4	39	2.7	78	9.5%	-10.00 [-11.86, -8.14]
Mendoza 2020	28.6	7.5	8	32.8	7	34	1.0%	-4.20 [-9.90, 1.50]
Panagiotakopoulos 2020	38	2.5	32	39	2.3	61	30.4%	-1.00 [-2.04, 0.04]
Savasi 2020	37.4	26.3	11	38.9	28.5	46	0.1%	-1.50 [-19.09, 16.09]
Vivanti 2020	30.6	9	52	31.6	6.1	48	3.7%	-1.00 [-3.99, 1.99]
Total (95% CI)			**302**			**407**	**100.0%**	**-2.49 [-3.07, -1.92]**

Heterogeneity: Chi² = 74.39, df = 7 (P < 0.00001); I² = 91%
Test for overall effect: Z = 8.51 (P < 0.00001)

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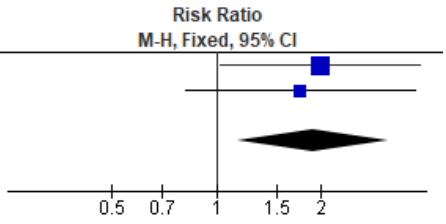
5.3.10. Association of severe COVID-19 with low birth weight

Study or Subgroup	Severe COVID-19 Events	Severe COVID-19 Total	Mild COVID-19 Events	Mild COVID-19 Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Di Mascio 2020	43	177	9	74	62.1%	2.00 [1.03, 3.89]
Maraschini 2020	10	48	12	101	37.9%	1.75 [0.82, 3.77]
Total (95% CI)		**225**		**175**	**100.0%**	**1.91 [1.15, 3.16]**
Total events	53		21			

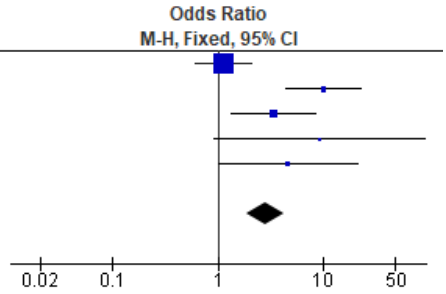
Heterogeneity: Chi² = 0.06, df = 1 (P = 0.80); I² = 0%
Test for overall effect: Z = 2.49 (P = 0.01)



5.3.11. Association of severe COVID-19 with neonatal intensive care unit (NICU) admission

Study or Subgroup	Severe COVID-19 Events	Severe COVID-19 Total	Mild COVID-19 Events	Mild COVID-19 Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Di Mascio 2020	50	177	19	74	66.3%	1.14 [0.62, 2.11]
Kayem 2020	27	59	10	131	11.6%	10.21 [4.48, 23.26]
Maraschini 2020	13	48	10	101	16.2%	3.38 [1.36, 8.41]
Martínez-Perez 2020	3	4	19	78	1.6%	9.32 [0.91, 94.93]
Savasi 2020	4	11	5	46	4.2%	4.69 [1.00, 21.85]
Total (95% CI)		**299**		**430**	**100.0%**	**2.84 [1.90, 4.25]**
Total events	97		63			

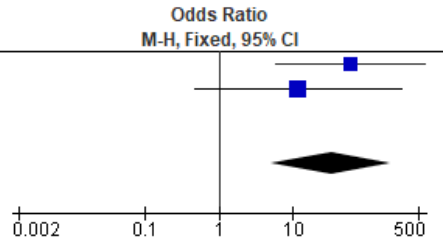
Heterogeneity: Chi² = 19.27, df = 4 (P = 0.0007); I² = 79%
Test for overall effect: Z = 5.07 (P < 0.00001)



5.3.12. Association of severe COVID-19 with neonatal death

Study or Subgroup	Severe COVID-19 Events	Severe COVID-19 Total	Mild COVID-19 Events	Mild COVID-19 Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Brandt 2020	6	7	5	54	44.3%	58.80 [5.85, 591.39]
Kayem 2020	1	128	0	489	55.7%	11.52 [0.47, 284.41]
Maraschini 2020	0	48	0	101		Not estimable
Total (95% CI)		**183**		**644**	**100.0%**	**32.47 [5.08, 207.65]**
Total events	7		5			

Heterogeneity: Chi² = 0.66, df = 1 (P = 0.42); I² = 0%
Test for overall effect: Z = 3.68 (P = 0.0002)



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