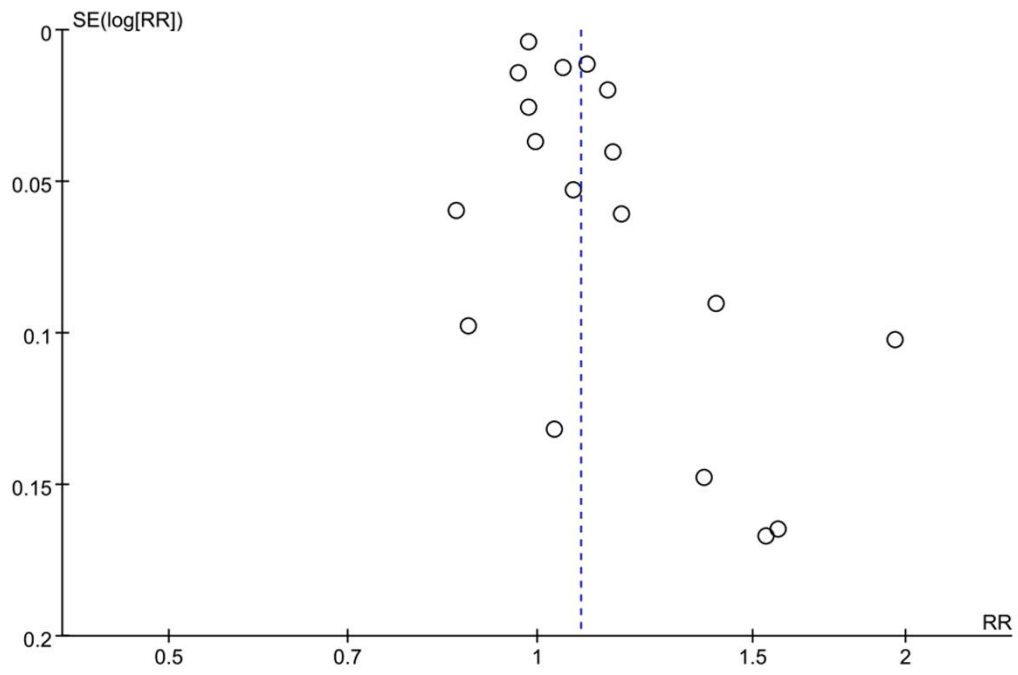
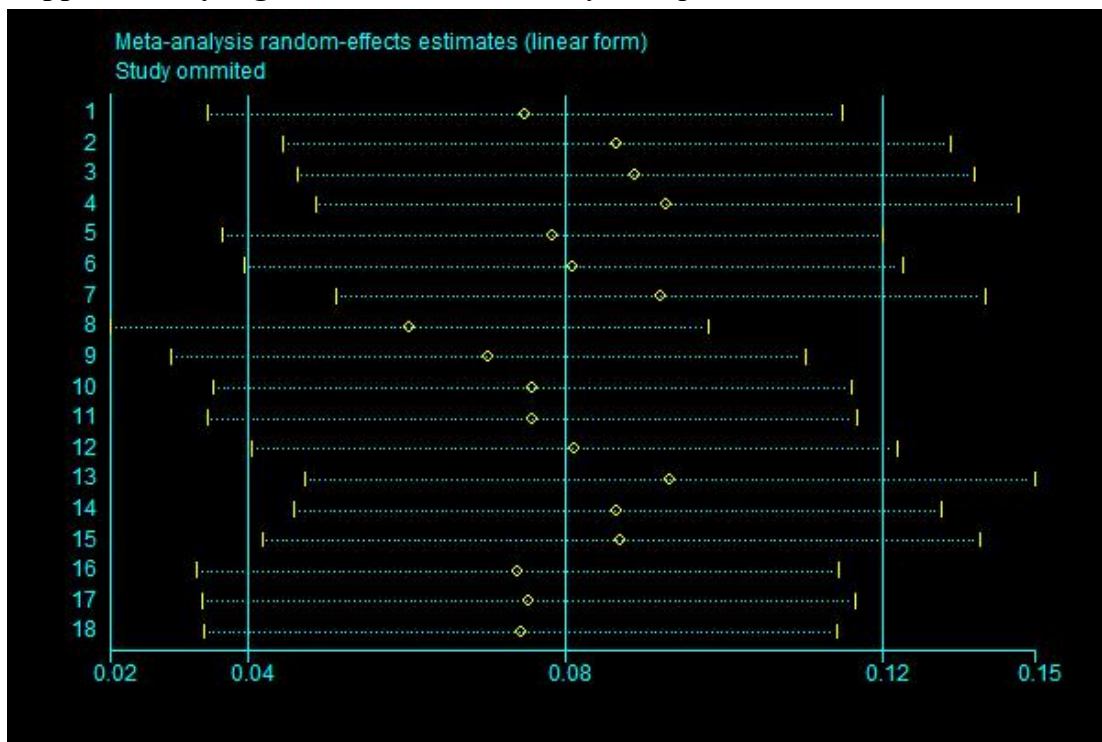


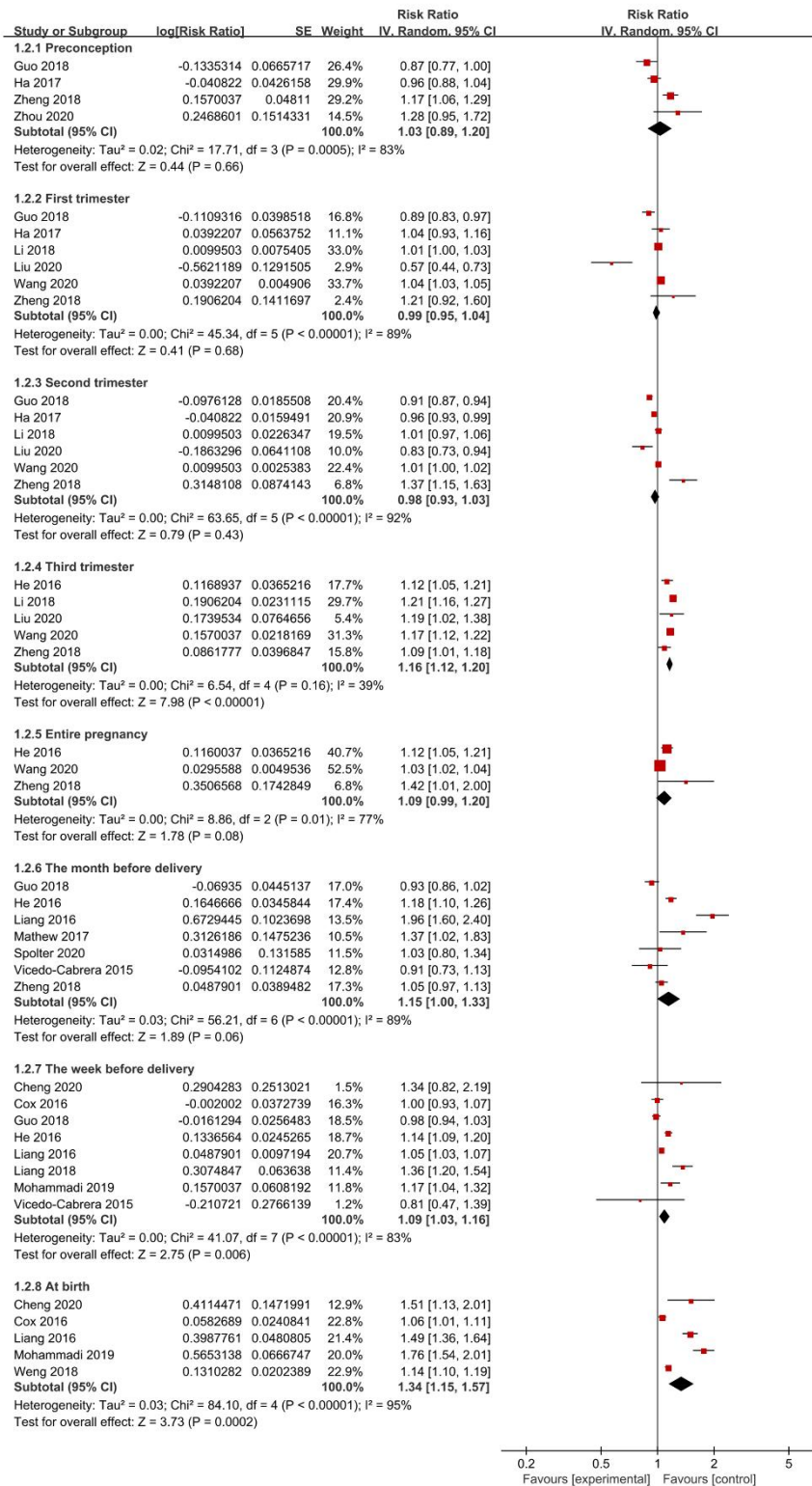
**Supplementary Figure 1:** Funnel plot of preterm birth studies.



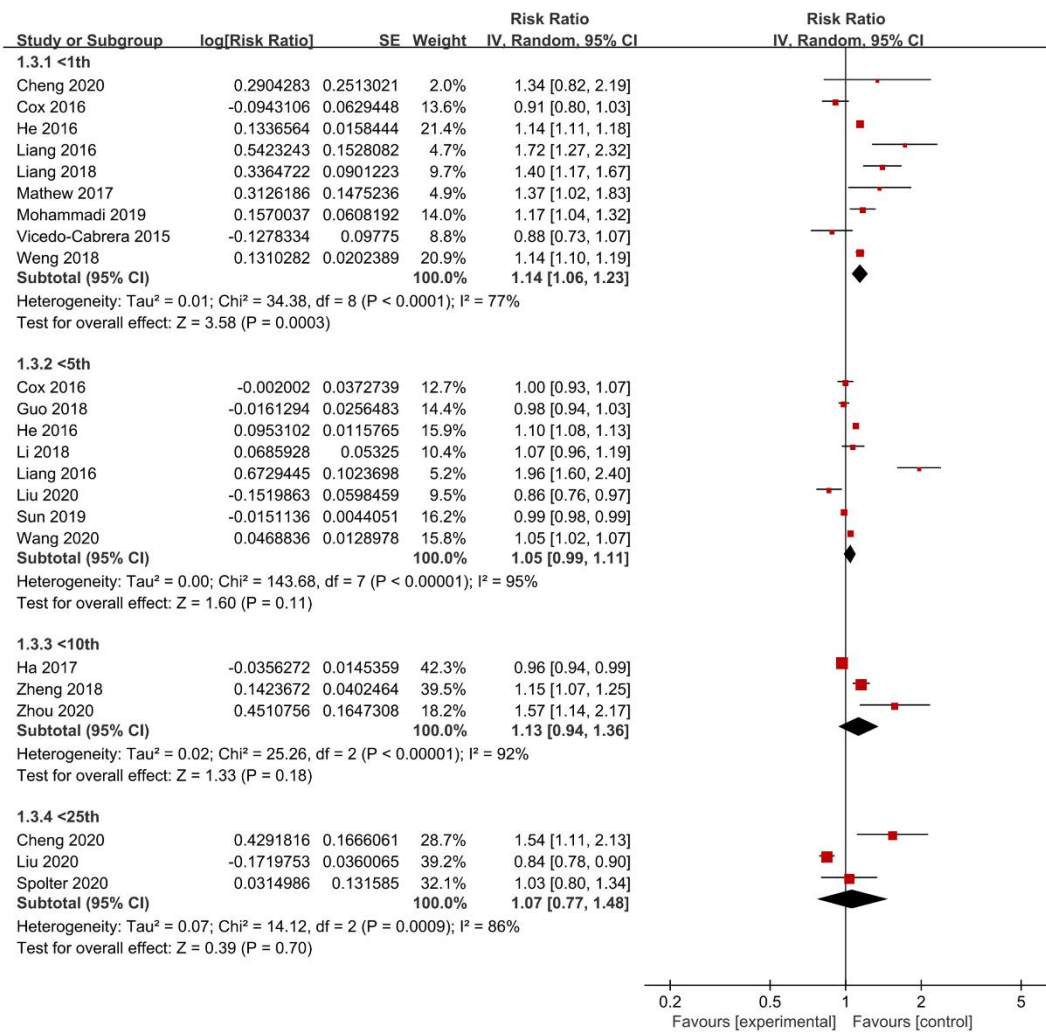
Supplementary Figure 2: The sensitive analysis of preterm birth studies.



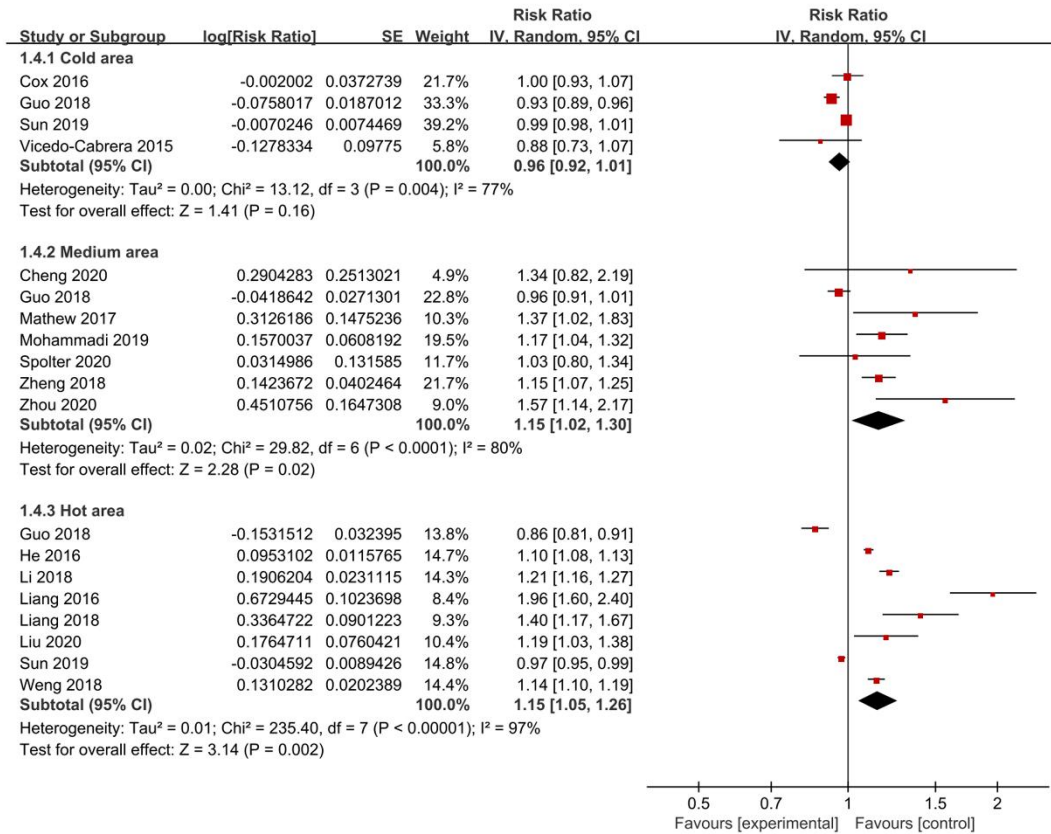
Supplemental Figure 3. Preterm birth sort by exposure time windows.



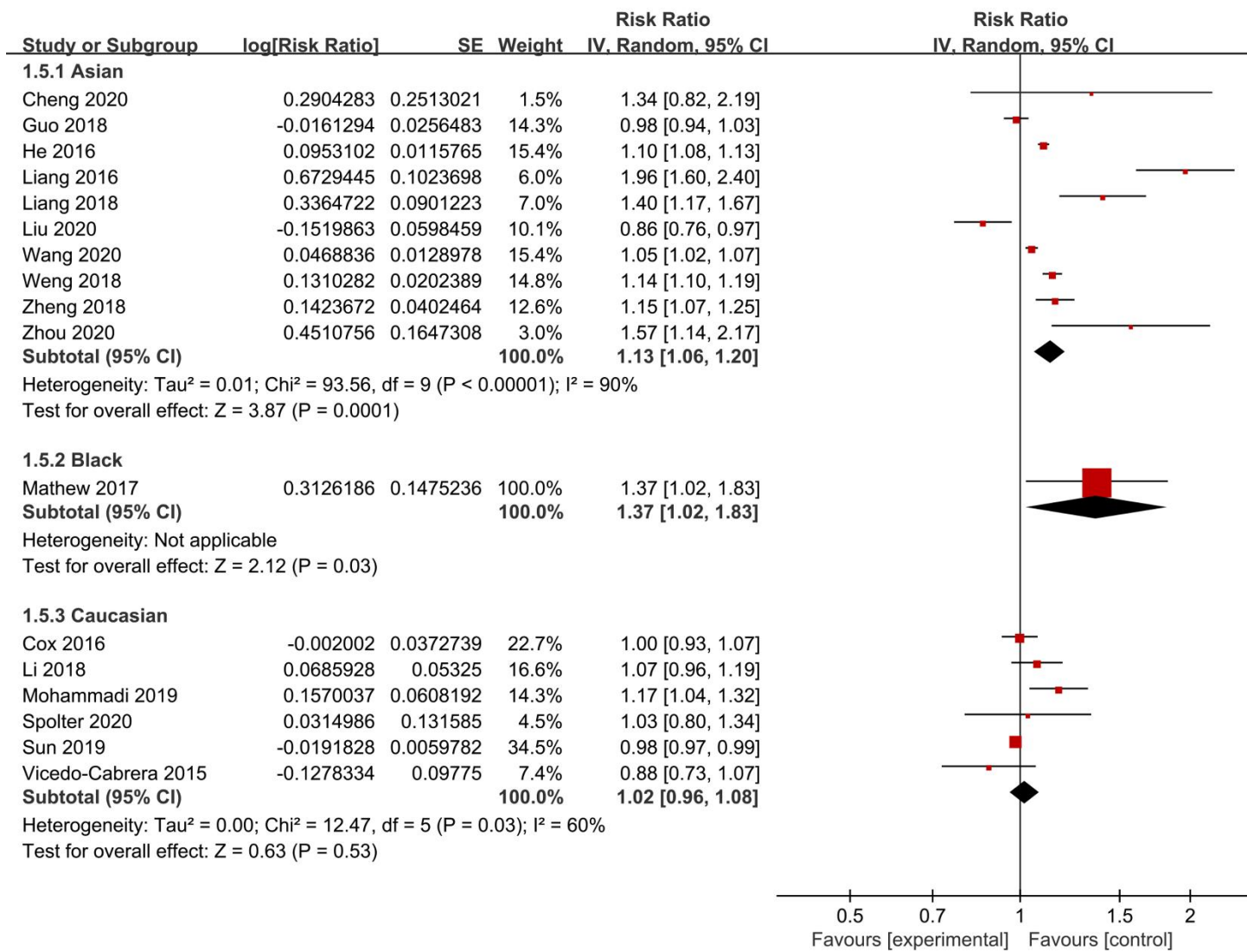
Supplementary Figure 4: Preterm birth sort by different temperature exposure levels.



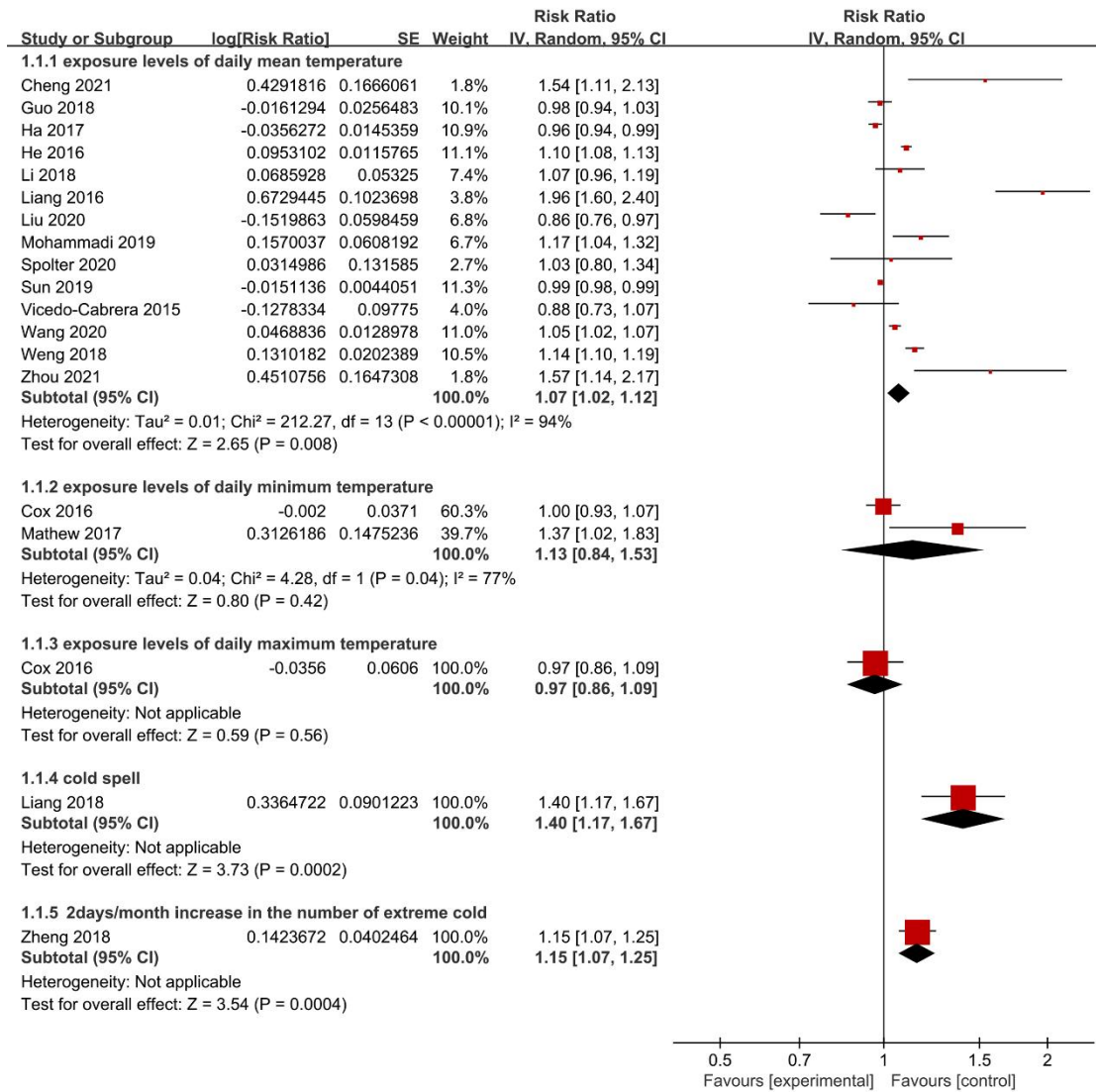
Supplementary Figure 5: Preterm birth sort by different climate areas.



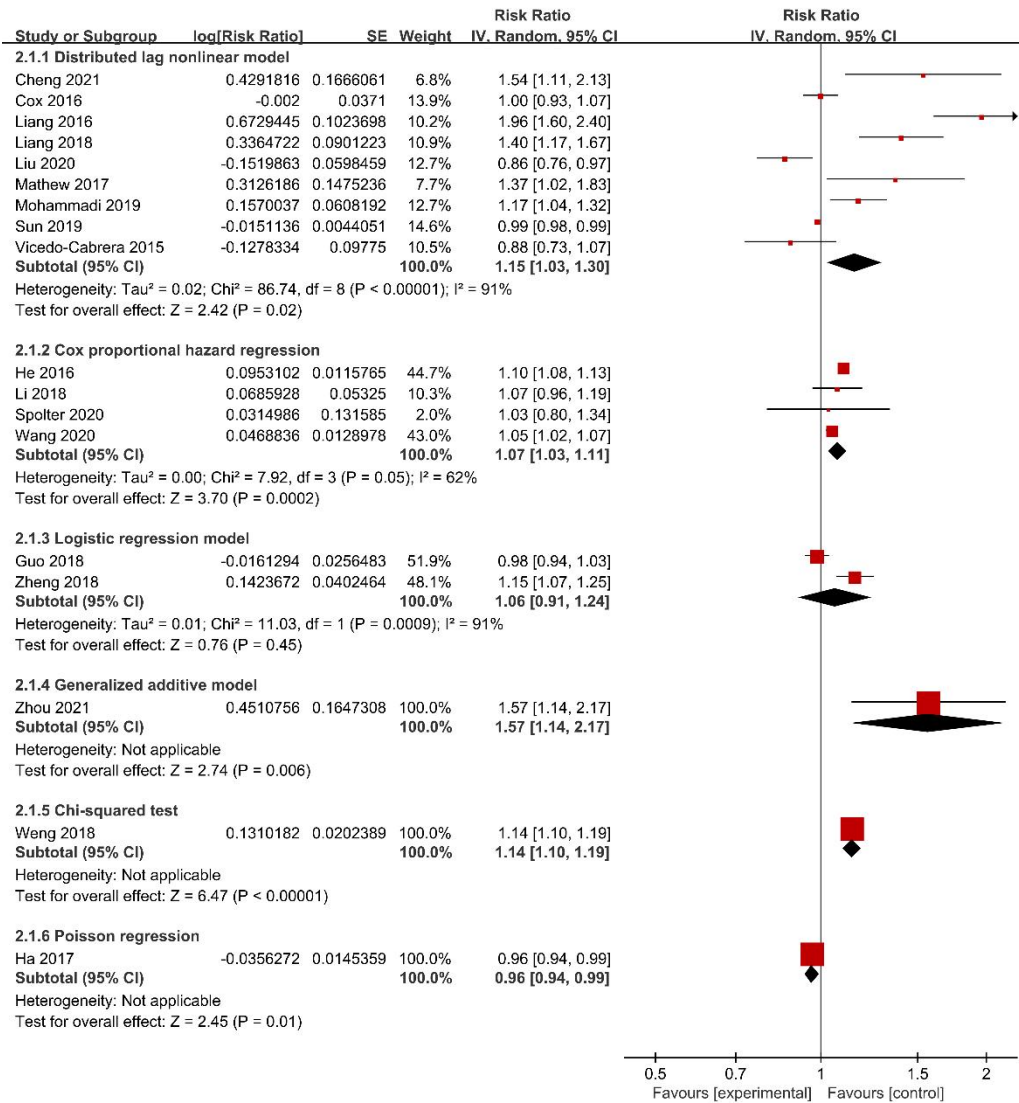
Supplementary Figure 6: Preterm birth sort by different ethnicities.



**Supplementary Figure 7: Preterm birth sort by various definitions of extreme low temperature.**

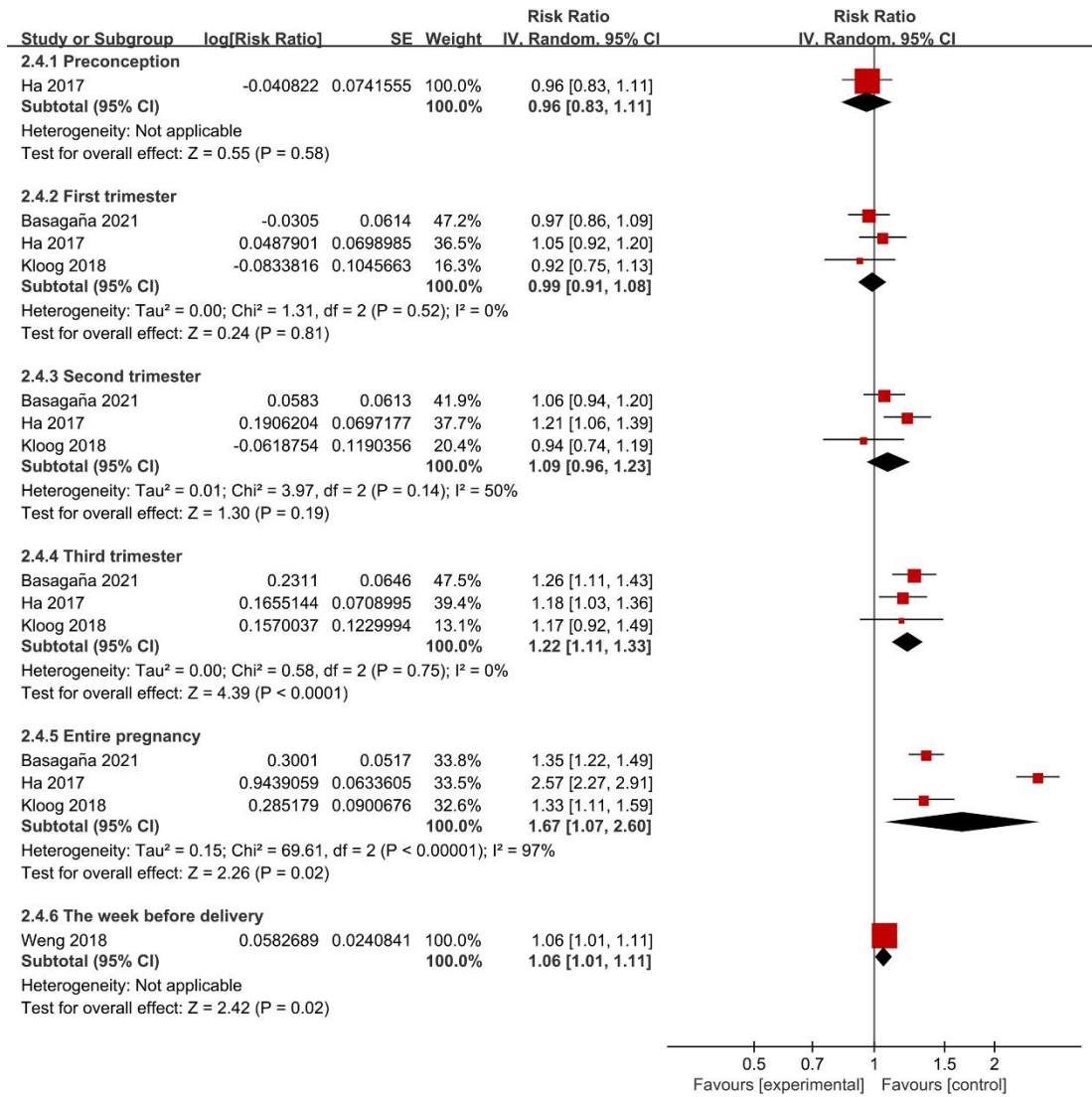


Supplementary Figure 8: Preterm birth sort by different methodological models.

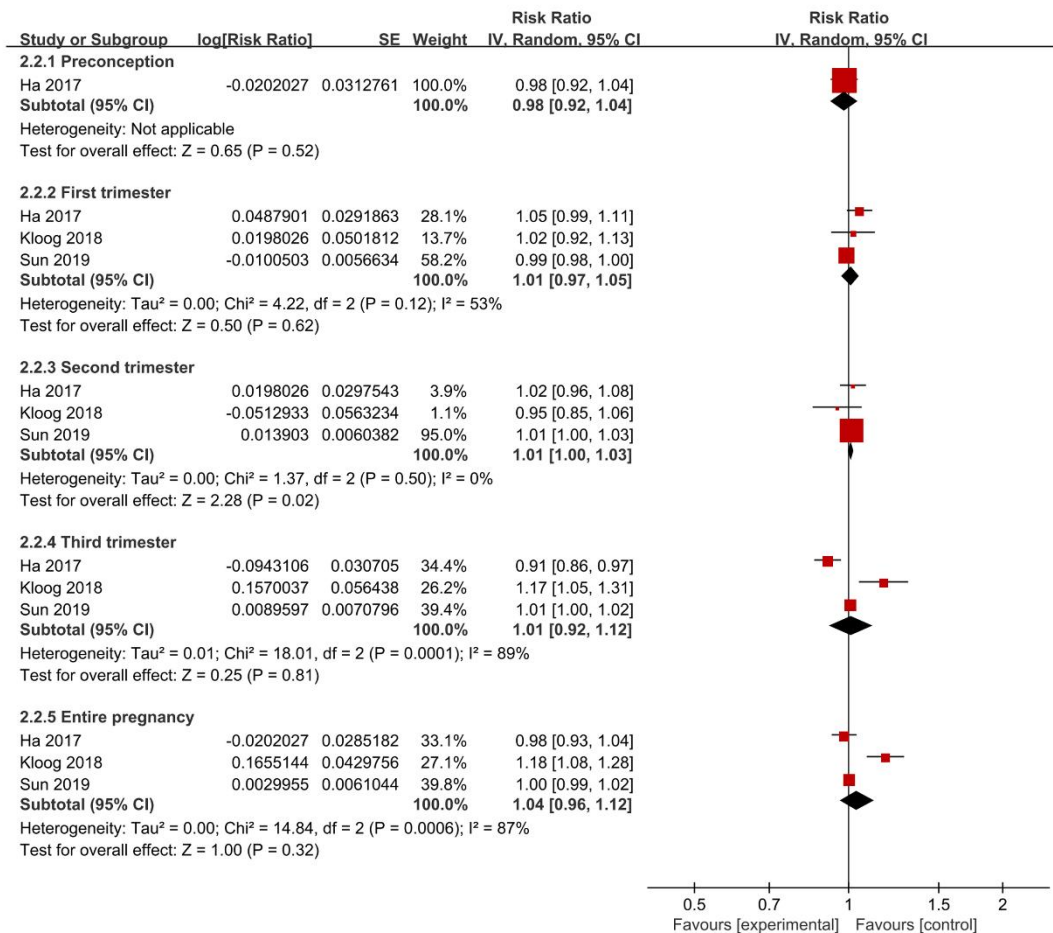




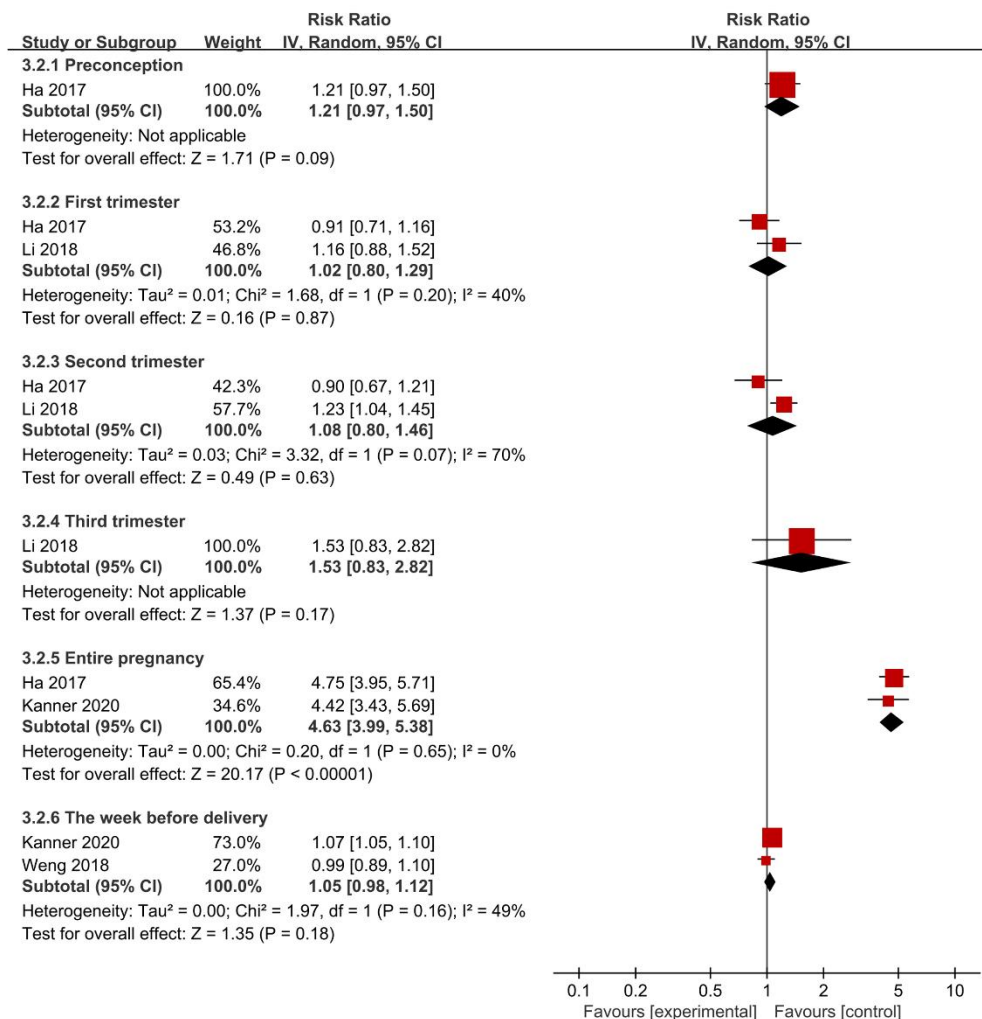
**Supplementary Figure 9: LBW sort by different exposure time windows. LBW: Low birth weight.**



**Supplementary Figure 10: SGA sort by different exposure time windows. SGA: Small for gestational age.**



Supplementary Figure 11: Stillbirth sort by exposure time windows.





**Supplementary Table 1: Characteristics of included studies.**

Name	Country	Study design	Year of study	Climate zone	Included meta-analysis	inSample (cases/total)	sizeMain outcome
LBW							
Weng <i>et al</i> <sup>[34]</sup>	Taiwan, China	Cohort study	2001–2010	Humid Tropical	Yes	Not provided/2,045,748	Temperature at birth. 21.5–23.4°C (reference group) Temperature 13.4–15.4°C RR = 1.06 (1.01, 1.11) Temperature 15.5–17.4°C RR = 1.02 (0.99, 1.04) Temperature 17.5–19.4°C RR = 0.99 (0.97, 1.02) Temperature 19.5–21.4°C RR = 1.01 (0.99, 1.04)
Sun <i>et al</i> <sup>[46]</sup>	The United States	Cohort study	1989–2002	–	Yes	Not provided/29,597,735	Birth weight. Mean daily temperature. Reference temperature 40th–50th Entire pregnancy temperatures <10th. Birth weight (difference in gram compared to reference group) Difference = –6 (–8, –4) 10th < Temperature <20th Difference = –2 (–3, 0)

					Outcome for small gestation weight
					Temperature <10th
					Entire pregnancy:
					OR = 1.00 (0.99, 1.02)
					First trimester:
					OR = 0.99 (0.98, 1.00)
					Second trimester:
					OR = 1.01 (1.00, 1.03)
					Third trimester:
					OR = 1.01 (0.99, 1.02)
Poeran <i>et al</i> <sup>[43]</sup>	The Netherlands Cohort study 2000–2008	–	No	Not provided/1460,401	Per 1°C decrease in mean Tmin
					Periconceptional day
					Birth weight decrease = 0.20 (–0.10, 0.60)g
					First trimester:
					Birth weight decrease = –0.30 (–0.80, 0.10)g
					Second trimester:
					Birth weight decrease = 0.40 (0, 0.80)g
					Third trimester:
					Birth weight decrease = 1.50 (1.20, 1.70)g
					day of birth
					Birth weight decrease = 0.10 (–0.20, 0.40)g
Lawlor <i>et al</i> <sup>[42]</sup>	Aberdeen, Cohort study 1950–1956	–	No	Not	Temperature increased per 1°C around conception

Scotland

provided/12,150 Birth weight change = -2.40 (-4.60, -0.20)g

In middle of first trimester

Birth weight change = -5.40 (-7.90, -2.90)g

In middle of second trimester

Birth weight change = 1.80 (-0.70, 4.30)g

In middle of third trimester

Birth weight change = 1.30 (0.50, 2.10)g

Around time of birth

Birth weight change = 3.60 (1.60, 5.70)g

Temperature during the third trimester and at birth positively associated with birth weight

Kloog *et al*<sup>[45]</sup> Southern Israel –

2004–2013

Mediterranean

Yes

climate,

semi-arid

climate, arid

climate, and

extreme arid

climate

LBW:

1716/56,141

SGA:

8634/56,141

Compared to two intermediate quartiles of temperature.

The lowest quartile in entire pregnancy for SGA

OR = 1.18 (1.09, 1.29)

The lowest quartile in first trimester for SGA

OR = 1.02 (0.92, 1.12)

The lowest quartile in second trimester for SGA

OR = 0.95 (0.85, 1.06)

The lowest quartile in third trimester for SGA

OR = 1.17 (1.05, 1.31)

The lowest quartile in entire pregnancy for tLBW

						OR = 1.33 (1.11, 1.58)
						The lowest quartile in first trimester for tLBW
						OR = 0.92 (0.75, 1.13)
						The lowest quartile in second trimester for tLBW
						OR = 0.94 (0.74, 1.18)
						The lowest quartile in third trimester for tLBW
						OR = 1.17 (0.92, 1.49)
Ha et al 2017 <sup>[44]</sup>	The United States	Cohort study 2002–2008	–	Yes	LBW: 4322/220,572	Compared with mild temperature (5th–95th) Low ambient temperature (5th) for SGA
					SGA: 22,239/220,572	Preconception RR = 0.98 (0.92, 1.04) Entire pregnancy RR = 0.98 (0.93, 1.04)
						First trimester RR = 1.05 (0.99, 1.11)
						Second trimester RR = 1.02 (0.97, 1.09)
						Third trimester RR = 0.91 (0.86, 0.97)
						Low ambient temperature (5th) for tLBW
						Preconception RR = 0.96 (0.83, 1.11)
						Entire pregnancy RR = 2.57 (2.27, 2.91)
						First trimester RR = 1.05 (0.92, 1.21)
						Second trimester RR = 1.21 (1.05, 1.38)
						Third trimester RR = 1.18 (1.03, 1.36)
Bruckner et al	Uppsala,	Cohort study 1915–1929	–	No	359/13,657	Birth weight for gestational age is not associated with



<i>al</i> <sup>[12]</sup>	Sweden					temperature Coefficients = -0.24 (-0.66, 018)
Pereira <i>et al</i> <sup>[41]</sup>	Perth, Australia	Cohort study 1998–2006	–	No	SGA: 12,031/147,357	The beta about proportion of optimal birthweight with temperature increase (interquartile range as a unit) First trimester $\beta = 0.13$ (0, 0.26) Second trimester $\beta = -0.05$ (-0.18, 0.08) Third trimester $\beta = -0.15$ (-0.29, 0.02) Entire pregnancy $\beta = -0.02$ (-0.11, 0.07)
Ngo <i>et al</i> <sup>[36]</sup>	Manhattan, New York, USA	Cohort study 1985–2010	–	No	Not provided/541,104	Compared to comfortable temperature (45–65°F) Exposure to an extra day (<25°F) in entire pregnancy, birth weight reduces 1.8g ( $P < 0.01$ ) Exposure to an extra day (<25°F) in first trimester, birth weight reduces 0.8g ( $P < 0.05$ ) Second trimester, birth weight reduces 0.6g ( $P < 0.05$ ) Third trimester, the reduce of birth weight is no significance
Murray <i>et al</i> <sup>[40]</sup>	Northern Ireland	–	1971–1986	–	No	Not provided/418,817 An increase of 1°C in daily mean Tmax in second trimester Birth weight in male increase 1.02 (SD: 0.88) ( $P = 0.25$ ) Birth weight in female increase 3.50 (SD: 0.88) ( $P < 0.01$ )

Molina and Saldarriaga <sup>[39]</sup>	Bolivia, Colombia, and Peru	–	1990–2013	–	No	Not provided/86,021	<p>First below historical mean temperature in whole pregnancy period</p> <p>The probability of LBW decreases 0.7% Compared to mean temperature (<math>\pm</math>omp SD)</p> <p>Exposure to low temperature (<math>&lt;-1.5</math> SD)</p> <p>First trimester birth weight = <math>-2.482</math> (NS)</p> <p>Second trimester birth weight = <math>19.608</math> (NS)</p> <p>Third trimester birth weight = <math>-8.483</math> (NS)</p> <p>Entire pregnancy birth weight = <math>1.959</math> (NS)</p>
Elter <i>et al</i> <sup>[14]</sup>	Istanbul, Turkey	–	1992–2003	–	No	Not provided/3333	<p>The coefficient of multiple regression analysis of birth weight and temperature exposure during second trimester <math>\beta = 0.001</math> (<math>P &lt; 0.05</math>)</p>
Basagaña <i>et al</i> <sup>[47]</sup>	Israel	–	2010–2014	Mediterranean climate, Steppe/semi-arid, Desert/arid	Yes	16,860/624,940	<p>Compared with average temperatures in the 41st–50th percentile range</p> <p>Mean temperature <math>&lt;10</math>th in entire pregnancy Birth weight = <math>-56</math> (<math>-63, -50</math>)g</p> <p>Mean temperature <math>&lt;10</math>th in first trimester Birth weight = <math>-10</math> (<math>-18, -2</math>)g</p> <p>Mean temperature <math>&lt;10</math>th in second trimester Birth weight = <math>-18</math> (<math>-27, -10</math>)g</p> <p>Mean temperature <math>&lt;10</math>th in third trimester</p>

Birth weight = -46 (-55, -38)g

Mean temperature <10th in entire pregnancy

RR for tLBW = 1.35 (1.22, 1.49)

Mean temperature <10th in first trimester

RR for tLBW = 0.97 (0.86, 1.09)

Mean temperature <10th in second trimester

RR for tLBW = 1.06; (0.94, 1.19)

Mean temperature <10th in third trimester

RR for tLBW = 1.26 (1.12, 1.43)

PTB

Zheng *et al*<sup>[35]</sup> Changsha, China Cohort study 2004–2010 Humid Yes 145/3604  
subtropical

Low temperature (<10th)

Conception months:

OR = 1.17 (1.06, 1.28)

First trimester:

OR = 1.21 (0.92, 1.60)

Second trimester:

OR = 1.37 (1.15, 1.62)

Third trimester:

OR = 1.09 (1.01, 1.18)

Birth month:

OR = 1.05 (0.99, 1.11)

						Entire pregnancy: OR = 1.42 (1.01, 2.00)
Weng <i>et al</i> <sup>[34]</sup>	Taiwan, China	Cohort study 2001–2010	Humid Tropical	Yes	Not provided/2,045,7	Temperature at birth. 21.5–23.4°C (reference group)
					48	Temperature 13.4–15.4°C RR = 1.14 (1.09, 1.18)
						Temperature 15.5–17.4 RR = 1.06 (1.04, 1.09)
						Temperature 17.5–19.4 RR = 1.03 (1.01, 1.06)
						Temperature 19.5–21.4 RR = 1.01 (0.99, 1.04)
Wang <i>et al</i> <sup>[33]</sup>	China	Cohort study 2013–2014	–	Yes	104,493/1,281,8	Low temperature (<5th)
					59	First trimester: HR = 1.04 (1.03, 1.05)
						Second trimester: HR = 1.01 (1.00, 1.01)
						Third trimester: HR = 1.17 (1.12, 1.22)
						Entire pregnancy HR = 1.03 (1.02, 1.04)
Vicedo-Cabrera	Stockholm,	Cohort study 1998–2006	Temperate	Yes	1204/36,577	Low temperature (<1st)

<i>et al</i> <sup>[32]</sup>	Swiss		continental climate and cold winters.			22–28 days before delivering RR = 0.88 (0.64, 1.23) 15–21 days before delivering RR = 0.93 (0.63, 1.38) 8–14 days before delivering RR = 0.94 (0.59, 1.49) 0–7 days before delivering RR = 0.81 (0.47, 1.39) Low temperature (<25th) Lag16–24 after exposure RR = 1.01 (1.00, 1.02)
Sun <i>et al</i> <sup>[31]</sup>	The States	United Cohort study 1989–2002	–	Yes	2,973,909/31,921,046	Increase days of extreme cold with lower RR = 0.99 (0.98, 0.99)
Spolter <i>et al</i> <sup>[30]</sup>	Israel	Cohort study 2004–2013	Mediterranean climate with cool and rainy winter	Yes	4852/62,547	Average temperature of the week of birth is divided into five quintiles Reference temperature: third quintile Temperature first quintile For early preterm HR = 1.16 (0.72, 1.85) For late preterm HR = 0.98 (0.83, 1.55) For early term

Mohammadi <i>et al</i> <sup>[29]</sup>	Sabzevar, Iran	Cohort study 2011–2017	Arid climate with four distinct seasons a hot and dry region	Yes	3140/Not provided	HR = 0.99 (0.92, 1.08) Lag0 highest impact, lag1, 2, 3, 4 also significant. Compared to 50th, log0 1st RR = 1.76 (1.54, 2) 25th RR = 1.13 (1.02, 1.25)
Muresan <i>et al</i> <sup>[38]</sup>	Romania	– 2014	A temperate climate with cool and humid winter	No	138/Not provided	Preterm birth frequency and mean weekly temperature $r = 0.306$ ( $P < 0.05$ ). SD in each week $r = 0.307$ ( $P < 0.01$ )
Mathew <i>et al</i> <sup>[28]</sup>	Alice springs, Australia	Cohort study 1986–2013	Hot semi-arid with cool winter	Yes	1401/16,870	Cumulative effects of 24 days before delivery Compared to 50th (14°C) Mean daily minimum temperature (0°C) RR = 1.072 (1.018, 1.130) Mean daily minimum temperature (6°C) RR = 1.367 (1.023, 1.824)
Liu <i>et al</i> <sup>[27]</sup>	Guangzhou, China	Cohort study 2014–2017	Subtropical climate with mild winters	Yes	234/4101	Compared with the mean temperature (24°C) as the reference Low temperature 14°C (5th) during 2nd to 10th and 20th to 26th gestational weeks is negatively associated to preterm birth. The strongest association is 4th and 23rd week, HR = 0.43 (0.26, 0.27) and HR = 0.59 (0.43, 0.83),

respectively

18°C (25th)

1st to 9th and 20th to 26th gestational weeks is negatively associated to preterm birth.

The strongest association is 4th and 23rd week, HR = 0.62 (0.46, 0.83) and HR = 0.69 (0.56, 0.86), respectively

Liang <i>et al</i> <sup>[26]</sup>	Shenzhen, China Cohort study 2005–2011	Subtropical climate with mild winters	Yes	58,411/1,040,638	Compared with the median daily mean temperature (24.5°C) as the reference The cumulative effect of 1st temperature (9°C) for 30 days before delivery. RR = 1.72 (1.28, 2.33) The cumulative effect of 5th temperature (12.5°C) for 30 days before delivery. RR = 1.96 (1.60, 2.39) The lag0 of 1st temperature (9°C) RR = 1.54 (1.36, 1.75) The lag0 of 5th temperature (12.5°C) RR = 1.49 (1.35, 1.63) The lag5 of 1st temperature (9°C) RR = 1.03 (1.00, 1.07) The lag5 of 5th temperature (12.5°C) RR = 1.05 (1.03, 1.07)
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Li <i>et al</i> <sup>[25]</sup>	Brisbane, Australia	Cohort study 1994–2013	Humid subtropical climate	Yes	22,822/289,351	Compared with reference temperature Low daily mean temperature (<5th) First trimester: HR = 1.01 (1.00, 1.03) Second trimester: HR = 1.01 (0.97, 1.06) Third trimester: HR = 1.21 (1.16, 1.27) Daily Tmax and Tmin had similar association
Ha <i>et al</i> 2017 <sup>[23]</sup>	The United States	Cohort study 2002–2008	–	Yes	26,130/223,375	Compared with mild temperature (10th–90th) Low ambient temperature (10th) for early preterm Preconception RR = 1 (0.92, 1.09) gestational week 1–7 RR = 1.20 (1.11, 1.30) gestational week 8–14 RR = 0.96 (0.89, 1.05) gestational week 15–21 RR = 1.00 (0.91, 1.09) gestational week 22–28 RR = 0.93 (0.85, 1.03)  Low ambient temperature (10th) for late preterm Preconception RR = 0.92 (0.86, 0.98) gestational week 1–7 RR = 1.09 (1.04, 1.15) gestational week 8–14 RR = 0.92 (0.87, 0.98) gestational week 15–21 RR = 0.94 (0.89, 1.00)



gestational week 22–28 RR = 0.97 (0.92, 1.03)

Guo <i>et al</i> <sup>[20]</sup>	China	Cohort study 2010–2013	–	Yes	12,433/138,672	Compared to moderate ambient temperature (5th to 95th) in different climate zone. In cold area, low temperature (<5th) in cold area during 3-month preconception OR = 0.89 (0.81, 0.98) In 15–21 gestational weeks OR = 0.90 (0.82, 0.98) NS in other pregnancy windows. In medium area, low temperature (<5th) In 8–14 gestational weeks OR = 0.86 (0.81, 0.91) In 15–21 gestational weeks OR = 0.92 (0.87, 0.98) NS in other pregnancy windows. In hot area, low temperature (<5th) In preconception OR = 0.78 (0.73, 0.83) In 1–7 gestational weeks OR = 0.85 (0.80, 0.91) In 8–14 gestational weeks OR = 0.79 (0.74, 0.84)
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						In 15–21 gestational weeks OR = 0.90 (0.84, 0.95)
						In 4 weeks before delivery OR = 0.87 (0.82, 0.93)
						In 1 week before delivery OR = 0.97 (0.91, 1.02)
Cox <i>et al</i> <sup>[13]</sup>	Flanders, Belgium	Cohort study 1998–2011	Oceanic temperature climate	Yes	27,076/807,835	Compared with median temperature (8.3°C for daily Tmin or 14.7°C for daily Tmax) In moderate cold (<5th, –2°C for Tmin) during a week before delivery RR = 1.00 (0.93, 1.07) In moderate cold (<5th, 2.5°C for Tmax) during a week before delivery RR = 0.97 (0.88, 1.05)  In extreme cold (<1st for Tmin) during a week before delivery RR = 0.91 (0.80, 1.03) In extreme cold (<1st for Tmax) during a week before delivery RR = 0.96 (0.86, 1.08) In moderate cold (<5th, –2°C for Tmin) in lag1

						RR = 1.06 (1.01, 1.06)
						In moderate cold (<5th, 2.5°C for Tmin) in lag 2
						RR = 1.05 (1.02, 1.08)
						NS for the other lag days and Tmax
Cheng <i>et al</i> <sup>[22]</sup>	XuZhou, China	Cohort study 2016–2019	Subtropical humid monsoon climate	Yes	4623/103,876	Compared with median ambient temperature (50th, 16.8°C) The RRs of cumulative effect of low temperature (1st, –2.8°C) Lag 0 RR = 1.51 (1.13, 2.01) Lag 0–1 RR = 1.66 (1.18, 2.34) Lag 0–2 RR = 1.58 (1.12, 2.22) Lag 0–3 RR = 1.48 (1.02, 2.14) Lag 0–4 RR = 1.42 (0.94, 2.13) Lag 0–5 RR = 1.37 (0.88, 2.15) Lag 0–6 RR = 1.34 (0.82, 2.19) Lag 0–7 RR = 1.31 (0.76, 2.24) Lag 0–8 RR = 1.27 (0.70, 2.29) Lag 0–9 RR = 1.232(0.65, 2.34)  The RRs of cumulative effect of low temperature (25th, 6.8°C) Lag 0 RR = 1.31 (1.11, 1.56)

						Lag 0–1 RR = 1.46 (1.18, 1.79)
						Lag 0–2 RR = 1.48 (1.20, 1.84)
						Lag 0–3 RR = 1.491 (1.17, 1.90)
						Lag 0–4 RR = 1.50 (1.15, 1.96)
						Lag 0–5 RR = 1.52 (1.13, 2.04)
						Lag 0–6 RR = 1.54 (1.11, 2.13)
						Lag 0–7 RR = 1.55 (1.08, 2.22)
						Lag 0–8 RR = 1.56 (1.05, 2.32)
						Lag 0–9 RR = 1.57 (1.03, 2.42)
Bruckner <i>et al</i> <sup>[12]</sup>	Uppsala, Sweden	Cohort study 1915–1929	–	No	359/13,657	Below the 25th percentile of ambient temperature, a 1°C increase in ambient temperature during entire pregnancy HR = 0.60 (0.51, 0.71)
Zhou <i>et al</i> <sup>[15]</sup>	Henan, China	Cohort study 2013–2016	Temperate monsoon climate	Yes	33,505/1,231,715	Exposure to extreme cold (<10th) within 3 weeks or longer before conception can elevate the risk of PTB, especially late PTB
Yackerson <i>et al</i> <sup>[37]</sup>	Negev, Israel	Cohort study 1999	Semi-arid area	No	992/11,979	Tmax regression coefficient = –0.09 (SE = 0.03, <i>P</i> < 0.01)
Ngo <i>et al</i> <sup>[36]</sup>	Manhattan, New York, USA	Cohort study 1985–2010	–	No	Not provided/510,781	Compared to comfortable temperature (45–65°F) Exposure to an extra day (<25°F) in any period of pregnancy is NS about reducing gestational weeks
Liang <i>et al</i> <sup>[21]</sup>	Dongguan and Shenzhen, China	Cohort study 2006–2010	Subtropical climate	Yes	Dongguan: 24,226/435,607	The cumulative effect of cold spell for lag 0–6 on preterm birth

						Shenzhen: Dongguan RR = 1.32 (1.10, 1.58)
					24,177/469,188	Shenzhen RR = 1.40 (1.18, 1.68)
						On early preterm birth (20–33 weeks)
						Dongguan RR = 1.09 (0.76, 1.57)
						Shenzhen RR = 1.11 (0.75, 1.63)
						On late preterm birth (34–36 weeks)
						Dongguan RR = 1.40 (1.15, 1.71)
						Shenzhen RR = 1.51 (1.24, 1.83)
						When maternal age <35 years the effect of cold spell on preterm birth
						Dongguan RR = 1.40 (1.16, 1.69)
						Shenzhen RR = 1.45 (1.20, 1.74)
						Maternal age >35 years
						Dongguan RR = 0.57 (0.26, 1.27)
						Shenzhen RR = 1.09 (0.54, 2.22)
He <i>et al</i> <sup>[24]</sup>	Guangzhou, China	Cohort study 2001–2011	Subtropical climate with mild winters	Yes	47,209/838,146	Compared with the median weekly mean temperature (24.4°C)
						Low ambient temperature in the whole-pregnancy (<1st, 7.6°C)
						HR = 1.12 (1.05, 1.21)
						Low ambient temperature in the late pregnancy (<1st, 7.6°C)

HR = 1.12 (1.05, 1.21)

Low ambient temperature during 28 days before delivery (<1st, 7.6°C)

HR = 1.18 (1.10, 1.26)

Low ambient temperature during 7 days before delivery (<1st, 7.6°C)

HR = 1.14 (1.09, 1.20)

Low ambient temperature in the whole-pregnancy (<5th, 11.2°C)

HR = 1.09 (1.03, 1.15)

Low ambient temperature in the late pregnancy (<5th, 11.2°C)

HR = 1.09 (1.03, 1.15)

Low ambient temperature during 28 days before delivery (<5th, 11.2°C)

HR = 1.13 (1.07, 1.19)

Low ambient temperature during 7 days before delivery (<5th, 11.2°C)

HR = 1.10 (1.06, 1.14)

Stillbirth

Weng *et al*<sup>[34]</sup> Taiwan, China Cohort study 2001–2010 Humid Tropical Yes Not

Temperature at birth.

						provided/2,045,7 21.5–23.4°C (reference group)
					48	Temperature 13.4–15.4°C RR = 0.99 (0.89, 1.10) Temperature 15.5–17.4 RR = 1.01 (0.95, 1.07) Temperature 17.5–19.4 RR = 0.96 (0.90, 1.02) Temperature 19.5–21.4 RR = 0.99 (0.93, 1.05)
Li <i>et al</i> <sup>[25]</sup>	Brisbane, Australia	Cohort study 1994–2013	Humid subtropical climate	Yes	1783/289,351	Compared with reference temperature Low daily mean temperature (<5th) First trimester: HR = 1.16 (0.88, 1.52) Second trimester: HR = 1.23 (1.04, 1.45) Third trimester: HR = 1.53 (0.83, 2.81) Daily Tmax and Tmin had similar association
Kanner <i>et al</i> <sup>[49]</sup>	The United States	Cohort study 2002–2010	–	Yes	500/112,005	Compared with moderate temperatures (10th–90th) Low ambient temperature in the whole-pregnancy (<10th) OR = 4.42 (3.43, 5.69)

						Acute low ambient temperature during a week before delivery (<10th) OR = 1.07 (1.04, 1.09)
Ha <i>et al</i> <sup>[48]</sup>	The United States	Cohort study 2002–2008	–	Yes	992/223,375	Compared with mild temperature (10th–90th) Low ambient temperature (10th) for stillbirth Preconception OR = 1.21 (0.97, 1.50) Whole Pregnancy OR = 4.75 (3.95, 5.71) Trimester 1 OR = 0.91 (0.71, 1.16) Trimester 2 OR = 0.90 (0.68, 1.22)
Bruckner <i>et al</i> <sup>[12]</sup>	Uppsala, Sweden	Cohort study 1915–1929	–	No	359/13,657	A 1°C decrease in ambient temperature during entire pregnancy HR = 1.08 (1.00, 1.17)

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HR: Hazard ratio; LBW: Low birth weight; NS: No significant; OR: Odds ratio; PTB: Preterm birth; RR: Risk ratio; SD: Standard deviation; SE: Standard error; SGA: Small for gestational ages; tLBW: Term low birth weight; Tmax: Maximum temperature; Tmin: Minimum temperature.



**Supplementary Table 2: Quality of evidence in included studies.**

Study	Newcastle–Ottawa scale score			Total score (* as 1 point)	Study quality
	Selection	Comparability	Outcome /exposure		
Bruckner <i>et al</i> <sup>[12]</sup>	**	**	***	7	High
Basagaña <i>et al</i> <sup>[47]</sup>	***	0	***	6	Moderate
Cheng <i>et al</i> <sup>[22]</sup>	**	0	***	5	Moderate
Cox <i>et al</i> <sup>[13]</sup>	***	**	***	8	High
Elter <i>et al</i> <sup>[14]</sup>	*	**	***	6	Moderate
Guo <i>et al</i> <sup>[20]</sup>	***	**	***	8	High
Ha <i>et al</i> <sup>[23]</sup>	***	**	***	8	High
Ha <i>et al</i> <sup>[44]</sup>	***	**	***	8	High
Ha <i>et al</i> <sup>[48]</sup>	***	**	***	8	High
He <i>et al</i> <sup>[24]</sup>	***	**	***	8	High
Kanner <i>et al</i> <sup>[49]</sup>	***	**	***	8	High
Kloog <i>et al</i> <sup>[45]</sup>	***	**	***	8	High
Lawlor <i>et al</i> <sup>[42]</sup>	***	**	***	8	High
Li <i>et al</i> <sup>[25]</sup>	***	**	***	8	High
Liang <i>et al</i> <sup>[26]</sup>	***	*	***	7	High
Liang <i>et al</i> <sup>[21]</sup>	***	*	***	7	High
Liu <i>et al</i> <sup>[27]</sup>	****	**	***	9	High
Mathew <i>et al</i> <sup>[28]</sup>	***	0	***	6	Moderate
Mohammadi <i>et al</i> <sup>[29]</sup>	***	*	***	7	High
Molina and Saldarriaga <sup>[39]</sup>	***	0	***	6	Moderate
Muresan <i>et al</i> <sup>[38]</sup>	***	0	**	5	Moderate
Murray <i>et al</i> <sup>[40]</sup>	**	*	***	6	Moderate
Ngo <i>et al</i> <sup>[36]</sup>	***	0	***	6	Moderate
Pereira <i>et al</i> <sup>[41]</sup>	***	**	***	8	High

Poeran <i>et al</i> <sup>[43]</sup>	***	*	***	7	High
Spolter <i>et al</i> <sup>[30]</sup>	***	*	***	7	High
Sun <i>et al</i> <sup>[31]</sup>	***	**	***	8	High
Sun <i>et al</i> <sup>[46]</sup>	***	*	***	7	High
Vicedo-Cabrera <i>et al</i> <sup>[32]</sup>	**	0	***	5	Moderate
Wang <i>et al</i> <sup>[33]</sup>	***	**	***	8	High
Weng <i>et al</i> <sup>[34]</sup>	***	**	***	8	High
Yackerson <i>et al</i> <sup>[37]</sup>	***	0	***	6	Moderate
Zheng <i>et al</i> <sup>[35]</sup>	***	**	***	7	High
Zhou <i>et al</i> <sup>[15]</sup>	***	**	***	8	High

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**Supplementary Table 3: Low ambient temperature exposure and adverse birth outcomes.**

<b>Outcome</b>	<b><i>N</i> of study</b>	<b>Pooled RR (95% CI)</b>	<b><i>I</i><sup>2</sup> (%)</b>
Preterm birth	18	1.08 (1.04, 1.13)	93
Low-birth weight	4	1.07 (1.03, 1.12)	0
Small for gestational age	3	1.00 (0.99, 1.02)	14
Stillbirth	4	1.12 (0.93, 1.36)	59

CI: Confidence interval; RR: Risk ratio.

**Supplementary Table 4: The result of trim and fill method to evaluate association of preterm birth.**

<b>Trimming estimator: Linear</b>					
<b>Meta-analysis type: Random-effects model</b>					
Iteration	Estimate	Tn	To trim	diff	
1	0.08	99	2	171	
2	0.05	114	3	30	
3	0.05	116	3	4	
4	0.05	116	3	0	
<b>Filled meta-analysis (exponential form)</b>					
Method	Pooled estimate	95% CI		<i>P</i> -value	No. of studies
		Lower	Upper		
Random	1.05	1.01	1.10	0.03	21

CI: Confidence interval.

**Supplementary Table 5: Subgroup analysis of different exposure time windows and birth weight.**

Name	Birth weight change in different periods of pregnancy			
	First trimester	Second trimester	Third trimester	Entire pregnancy
Basagaña <i>et al</i> <sup>[47]</sup>	-10 (-18, -2)g	-18 (-27, -10)g	-46 (-55, -38)g	-56 (-63, -50)g
Molina and Saldarriaga <sup>[39]</sup>	-2.40 (-3.54, -1.26)g	-1.48 (-2.64, -0.32)g	-0.39 (-1.74, 0.96)g	-
Ngo <i>et al</i> <sup>[36]</sup>	-2.48 (-59.62, -54.65)g	-19.61 (-28.34, -67.56)g	-1.96 (-86.11, -90.03)g	-
Sun <i>et al</i> 2019 <sup>[46]</sup>	-	-	-	-6 (-8, -2)g