## SUPPLEMENTARY MATERIAL

## **Supplementary Figure 1: Detailed Search Queries**

Database	Search Query
Medline	((((("Breast Neoplasms"[Mesh]) OR "Breast Cancer") AND ("Triple Negative Breast Neoplasms"[Mesh] OR "luminal" OR "basal-like")) AND ((((("Menarche"[Mesh]) OR "Menopause"[Mesh])OR "menopausal" OR "age at first birth") OR "Parity"[Mesh]) OR "Breast Feeding"[Mesh]) OR "Hormone Replacement Therapy"[Mesh]) OR "Estrogen Replacement Therapy"[Mesh]OR "HRT" OR "postmenopausal hormone" OR "hormone therapy" OR "estrogen therapy")) AND (((((("Contraceptives, Oral"[Mesh]) OR "Medical History Taking"[Mesh]) OR "Fibrocystic Breast Disease"[Mesh]) OR "Body Mass Index"[Mesh]) OR "Obesity"[Mesh]) OR "Alcohols"[Mesh]) OR "Breast Density"[Mesh] OR "mammographic density")
EMBASE	'breast cancer'/exp OR 'breast tumor'/exp OR 'triple negative breast cancer'/exp AND 'menarche'/exp OR 'age at menarche'/exp OR 'parity'/exp OR 'obesity'/exp OR 'alcohol consumption'/exp OR 'oral contraceptive use'/exp OR 'breast feeding duration'/exp OR 'menopause'/exp OR 'breast density'/exp OR 'hormone substitution'/exp OR 'family history'/exp OR 'biopsy'/exp AND [female]/lim AND [adult]/lim AND ('Article'/it OR 'Article in Press'/it) AND ('case control study'/de OR 'cohort analysis'/de OR 'controlled clinical trial'/de OR 'controlled study'/de OR 'longitudinal study'/de OR 'population based case control study'/de OR 'prospective study'/de OR 'randomized controlled trial'/de OR 'retrospective study'/de)
SCOPUS	( TITLE-ABS-KEY ( breast AND cancer OR breast AND neoplasm OR triple AND negative AND breast AND cancer ) AND TITLE-ABS-KEY ( "Menarche" OR "Parity" OR "Adiposity" OR "Alcohol Drinking" OR "Contraceptives, Oral" OR "Breast Feeding" OR "Menopause" OR "Breast Density" OR "Hormone Replacement Therapy" OR age AND at AND menarche OR age AND at AND menopause OR biopsy AND history ) )

## **Supplementary Figure 2: Data Extraction Template**

4	А	В	С	D	E	F	G	Н	I	J	K	L	М
1	Study ID	Exposure	Unit	Authors, Title	Design	Duration (days)	Location	-	Exposure level in "Non-exposed"	"Exposed" group N	"Non- Exposed" group N	Exposed # of outcome events	"Non-exposed" # of outcome events
2	Study 1	Exposure A											
3	Study 1	Exposure B											
4	Study 1	Exposure C											
5	Study 2	Exposure B											
6	Study 2	Exposure C											
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													

## Supplementary Figure 3: Example of risk of bias Assessment for the study Akinyemiju et al 2021

#### Risk of Bias Assessment

Scale/Tool: Newcastle - Ottawa Quality Assessment Scale for Case Control Studies

Study Authors: Akinyemiju et al 2021

Study Title: Association of body composition with odds of breast cancer by molecular subtype: analysis of the mechanisms for established and novel risk factors for breast cancer in Nigerian women (MEND) study

Scoring criteria: A study can be awarded a maximum of one star (1 point) for each numbered item within the Selection and Exposure categories. A maximum of two stars (2 points) can be given for Comparability.

#### Section A: Selection

- 1) Is the case definition adequate?
  - a) yes, with independent validation (if cases come from registry, laboratory data)
  - b) yes, eg record linkage or based on self-reports
  - c) no description
- 2) Representativeness of the cases
  - a) consecutive or obviously representative series of cases (star if cases come from geographic area or hospital)
  - b) not stated
- 3) Selection of Controls
  - a) community controls \* (1 point)
  - b) hospital controls
  - c) no description
- 4) Definition of Controls
  - a) no history of disease (endpoint) \* (1 point)
  - b) no description of source

#### Section B: Comparability

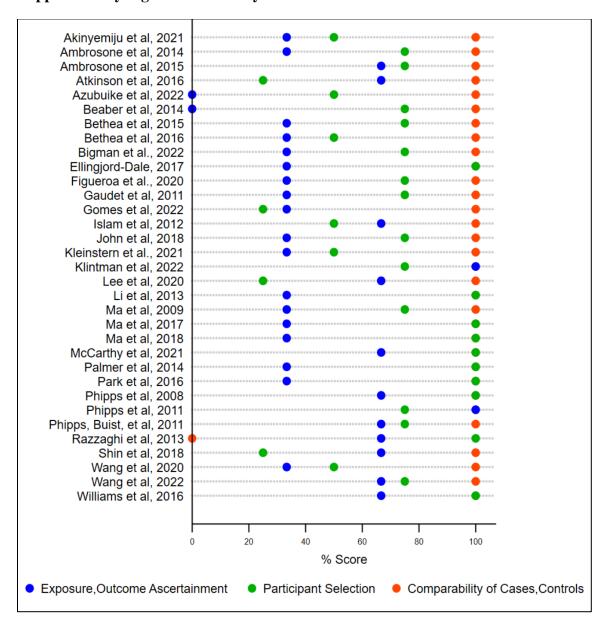
- 1) Comparability of cases and controls on the basis of the design or analysis
  - a) study controls for Age \* (1 point)
  - b) study controls for additional factors (sociodemographic characteristics, reproductive history, and self and family history of cancer; anthropometric measurements) \* (1 point)

#### Section C: Exposure

- 1) Ascertainment of exposure
  - a) secure record (eg surgical records)
  - b) structured interview where blind to case/control status
  - c) interview not blinded to case/control status
  - d) medical record only
  - e) no description
- 2) Same method of ascertainment for cases and controls
  - a) yes\_\*(1 point)
  - b) no
- 3) Non-Response rate
  - a) same rate for both groups (10% or less difference)
  - b) non respondents described
  - c) rate different and no designation

SCORES: Selection = 2 out of 4 (50%), Comparability = 2 out of 2 (100%), Exposure ascertainment = 1 out of 3 (0.33%)

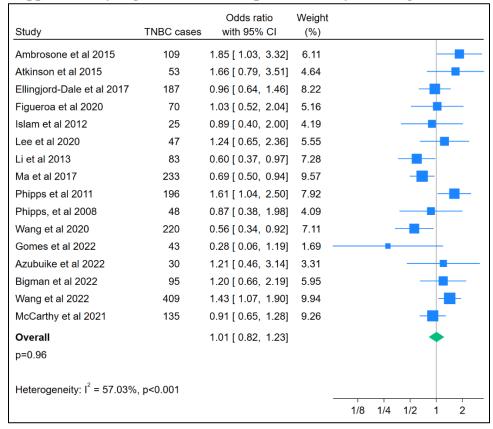
#### Supplementary Figure 4: Summary of Risk of Bias Assessment Scores for Included Studies



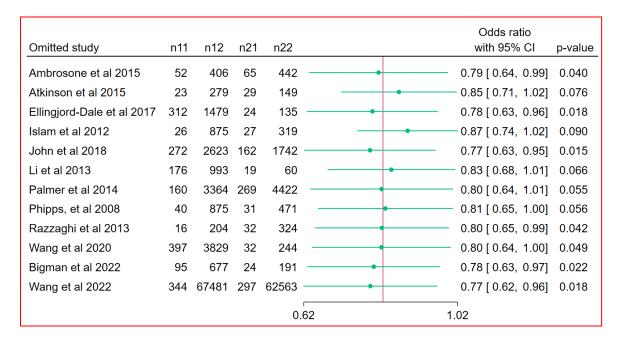
### Supplementary Figure 5 - a: Leave One Out Sensitivity Analysis for Parity

Omitted study	n11	n12	n21	n22	Odds ratio with 95% Cl p-valu	ue
Ambrosone et al 2015	95	614	14	167	0.96 [ 0.77, 1.20] 0.713	3
Atkinson et al 2015	44	353	9	120	0.97 [ 0.78, 1.21] 0.795	5
Ellingjord-Dale et al 2017	153	673	34	144	1.00 [ 0.79, 1.26] 0.972	2
Figueroa et al 2020	60	1332	10	228	0.99 [ 0.79, 1.25] 0.945	5
Islam et al 2012	14	307	11	215	1.00 [ 0.80, 1.25] 0.987	7
John et al 2018	184	2164	124	746	1.05 [ 0.86, 1.30] 0.61	1
Lee et al 2020	32	290	15	169	0.98 [ 0.78, 1.23] 0.876	6
Li et al 2013	32	198	51	188	1.03 [ 0.82, 1.28] 0.814	4
Ma et al 2017	165	882	68	250	1.02 [ 0.81, 1.28] 0.845	5
Palmer et al 2014	102	2140	73	2709	0.95 [ 0.76, 1.18] 0.623	3
Phipps, Chlebowski, Prentice, et al 2011	173	81558	23	17509	0.96 [ 0.77, 1.20] 0.725	5
Phipps, et al 2008	41	877	7	130	1.00 [ 0.80, 1.25] 0.994	4
Wang et al 2020	200	1952	20	109	1.03 [ 0.83, 1.28] 0.789	9
Gomes et al 2022	2	48	41	273	1.02 [ 0.82, 1.26] 0.882	2
Azubuike et al 2022	24	146	6	44	0.99 [ 0.79, 1.24] 0.910	0
Bigman et al 2022	81	564	14	117	0.98 [ 0.78, 1.24] 0.885	5
Wang et al 2022	356	69451	53	14749	0.96 [ 0.77, 1.21] 0.757	7
McCarthy et al 2021	66	43049	69	40963	1.00 [0.79, 1.26] 0.998	8
				0.	.76 1.30	

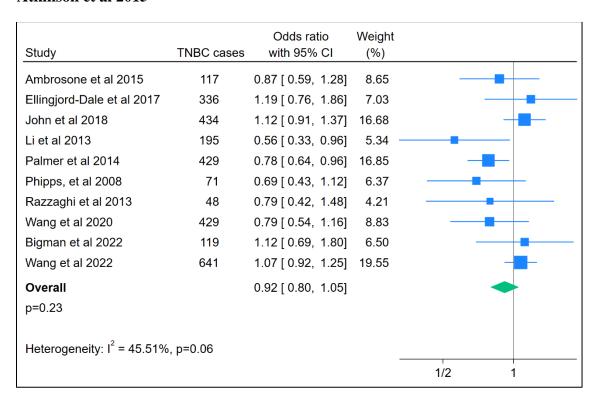
### Supplementary Figure 5 - b: Forest plot for Parity omitting Palmer et al 2014, John e al 2018



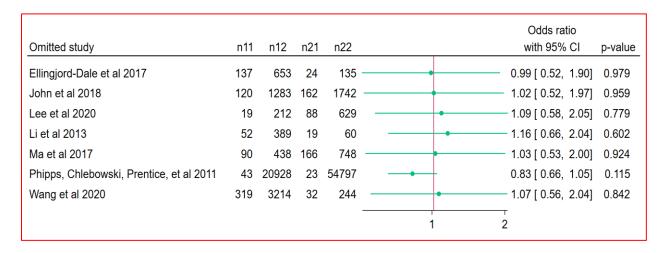
# Supplementary Figure 6 - a: Leave One Out Sensitivity Analysis for Breastfeeding (ever vs. never)



## Supplementary Figure 6 - b: Forest Plot for Breastfeeding after omitting Islam et al 2012 and Atkinson et al 2015



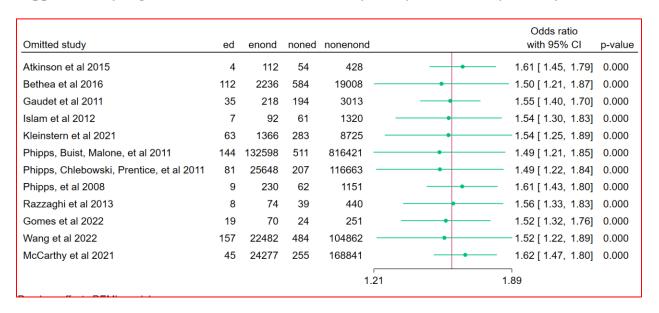
## Supplementary Figure 7-a: Leave One Out Sensitivity Analysis for Duration of Breastfeeding



# Supplementary Figure 7-b: Forest Plot for Duration of Breastfeeding after omitting Phipps et al 2011

Study	TNBC cases	Odds ratio with 95% CI	Weight (%)	
Ellingjord-Dale et al 2017	161	1.18 [ 0.74, 1.89]	13.89	
John et al 2018	282	1.01 [ 0.79, 1.29]	24.03	_
Lee et al 2020	107	0.64 [ 0.38, 1.08]	12.35	
Li et al 2013	71	0.42 [ 0.23, 0.76]	10.41	
Ma et al 2017	256	0.93 [ 0.70, 1.23]	22.14	
Wang et al 2020	351	0.76 [ 0.51, 1.11]	17.18	-
Overall		0.83 [ 0.66, 1.05]		
p=0.11				
Heterogeneity: I <sup>2</sup> = 53.37%	, p=0.06			
				1/4 1/2 1

#### Supplementary Figure 8: Leave One Out Sensitivity Analysis for Family History



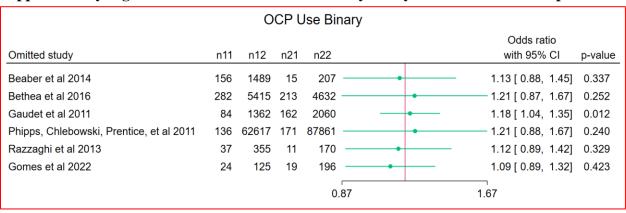
## Supplementary Figure 9: Leave One Out Sensitivity Analysis for Age at Menarche

						Odds ratio	
Omitted study	n11	n12	n21	n22		with 95% CI	p-value
Ambrosone et al 2015	71	2005	371	9063		0.87 [ 0.79, 0.96]	0.004
John et al 2018	139	1499	264	2290	•	<b>-</b> 0.88 [ 0.80, 0.97]	0.013
Li et al 2013	102	523	44	191		0.87 [ 0.80, 0.95]	0.003
Ma et al 2017	107	522	289	1292	•	0.86 [ 0.79, 0.95]	0.002
Wang et al 2020	183	1746	172	1505	•	0.86 [ 0.78, 0.95]	0.002
Phipps, Chlebowski, Prentice, et al 2011	67	34660	79	32816	•	0.88 [ 0.80, 0.96]	0.005
Phipps, et al 2008	41	817	37	658		0.87 [ 0.79, 0.95]	0.002
Wang et al 2022	141	28756	319	61156	•	0.85 [ 0.77, 0.94]	0.002
McCarthy et al 2021	63	46421	57	30899	•	0.88 [ 0.80, 0.96]	0.006
				0.	77 0	¬ ).97	

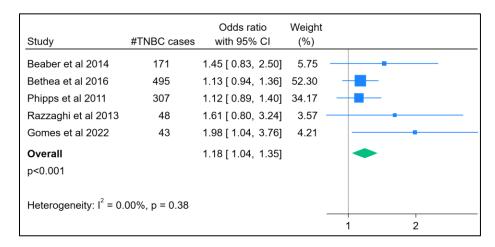
#### Supplementary Figure 10: Leave One Out Sensitivity Analysis for Age at 1st Live Birth

						Odds ratio	
Omitted study	n11	n12	n21	n22		with 95% CI	p-value
Ambrosone et al 2015	47	1542	452	10026	•	0.81 [ 0.64, 1.01]	0.063
Ellingjord-Dale et al 2017	29	120	95	495 -	•	0.74 [ 0.61, 0.90]	0.002
Islam et al 2012	5	154	26	442	•	0.79 [ 0.65, 0.97]	0.026
Li et al 2013	65	462	37	162	•	0.81 [ 0.66, 1.00]	0.052
Ma et al 2017	73	333	165	799 —	•	0.73 [ 0.61, 0.88]	0.001
Wang et al 2020	26	293	211	1987 -	•	0.77 [ 0.62, 0.97]	0.027
Phipps, Chlebowski, Prentice, et al 2011	16	10861	43	19365	•	0.80 [ 0.64, 0.98]	0.036
Phipps, et al 2008	4	113	14	274		0.79 [ 0.64, 0.96]	0.020
McCarthy et al 2021	54	40407	42	19702	•	0.81 [ 0.66, 1.00]	0.055
				0.61	1	01	
Develope # DEMI				0.01	1.	O 1	

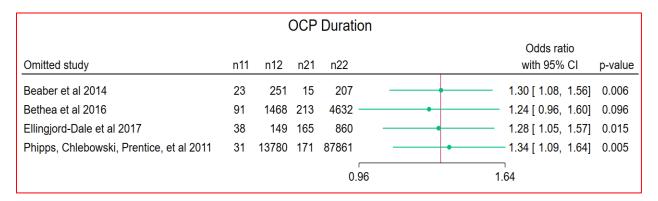
#### Supplementary Figure 11a: Leave One Out Sensitivity Analysis for Oral Contraceptive Use



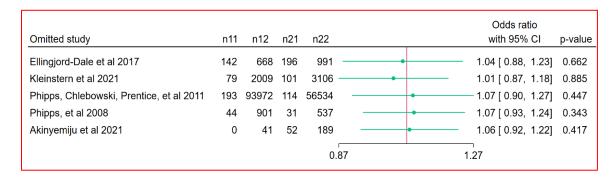
#### Supplementary Figure 11b: Forest Plot for OCP Use after omitting Phipps et al 2011



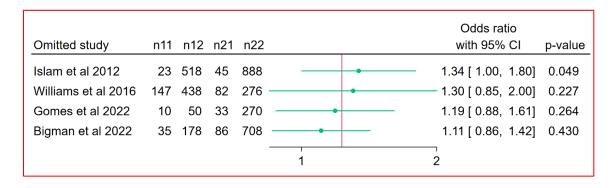
# Supplementary Figure 12: Leave One Out Sensitivity Analysis for Duration of Oral Contraceptive Use



#### Supplementary Figure 13: Leave One Out Sensitivity Analysis for MHT Use



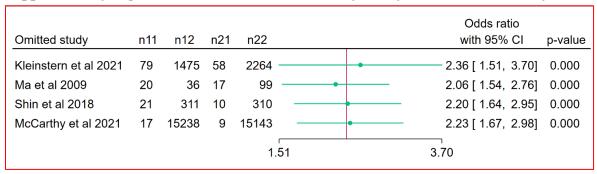
#### Supplementary Figure 14 Leave One Out Sensitivity Analysis for Alcohol Use



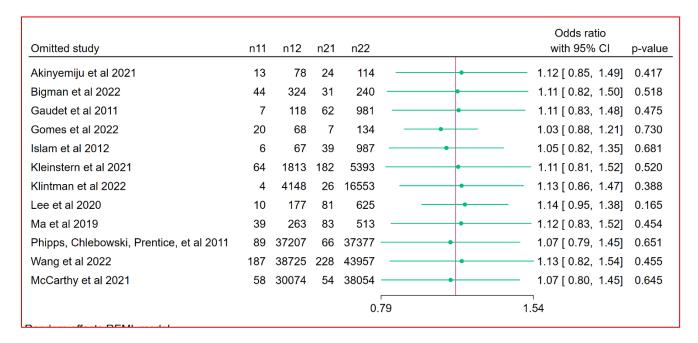
#### Supplementary Figure 15 Leave One Out Sensitivity Analysis for Smoking

Omitted study	n11	n12	n21	n22			Odds ratio with 95% CI	p-value
Park et al 2017	314	7756	380	9620	•		0.94 [ 0.83, 1.06]	0.311
Phipps, Chlebowski, Prentice, et al 2011	147	72648	158	75933			0.97 [ 0.87, 1.08]	0.598
Gomes et al 2022	12	91	31	230			0.97 [ 0.88, 1.07]	0.563
Bigman et al 2022	0	7	121	879			0.97 [ 0.88, 1.07]	0.572
Wang et al 2022	307	63626	334	63718		•	1.01 [ 0.89, 1.14]	0.928
				o.8	83	1.	1 14	

### Supplementary Figure 16 Leave One Out Sensitivity Analysis for Breast Density



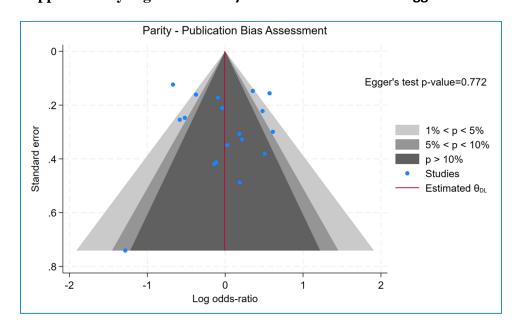
#### Supplementary Figure 17-a Leave One Out Sensitivity Analysis for BMI



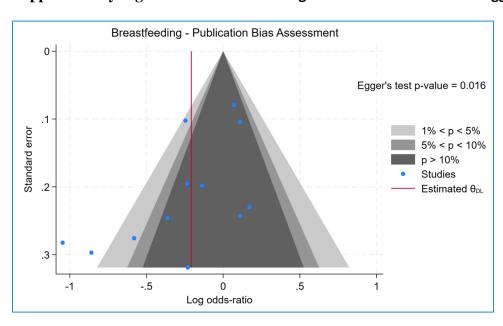
## Supplementary Figure 17-b Forest Plot for BMI after omitting Gomes et al 2022

Study	TNBC cases	Odds ratio with 95% CI	Weight (%)	:				
Akinyemiju et al 2021	37	0.79 [ 0.38, 1.65]	4.10			-		
Bigman et al 2022	75	1.05 [ 0.64, 1.71]	8.01		-	-		
Gaudet et al 2011	69	0.94 [ 0.42, 2.10]	3.48			-		
Islam et al 2012	45	2.27 [ 0.93, 5.54]	2.87			-	-	
Kleinstern et al 2021	246	1.05 [ 0.78, 1.40]	15.84					
Klintman et al 2022	30	0.61 [ 0.21, 1.76]	2.12		-		_	
Lee et al 2020	91	0.44 [ 0.22, 0.86]	4.71		•	_		
Ma et al 2019	122	0.92 [ 0.61, 1.38]	10.40		_			
Phipps et al 2011	155	1.35 [ 0.98, 1.86]	14.25				<b>—</b>	
Wang et al 2022	415	0.93 [ 0.77, 1.13]	22.37					
McCarthy et al 2021	112	1.36 [ 0.94, 1.97]	11.84			+-	_	
Overall		1.03 [ 0.88, 1.21]				•		
p=0.73		_						
Heterogeneity: I <sup>2</sup> = 30.0	64%, p=0.07			1/4	1/2	1	2	4

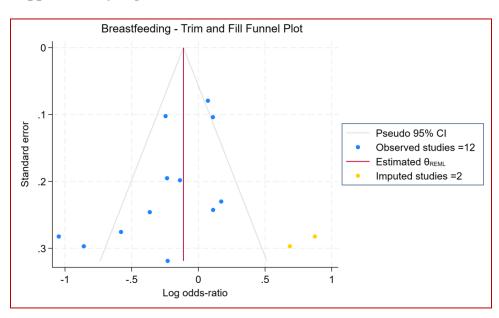
## Supplementary Figure 18: Parity - Contour Funnel Plot & Egger's test Assessment



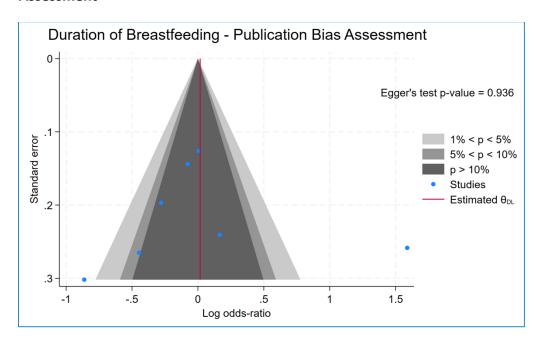
### Supplementary Figure 19 –a: Breastfeeding - Contour Funnel Plot and Egger's Test Assessment



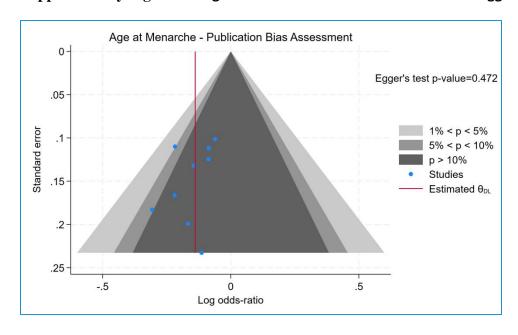
### Supplementary Figure 19-b: Breastfeeding - Trim and Fill Plot



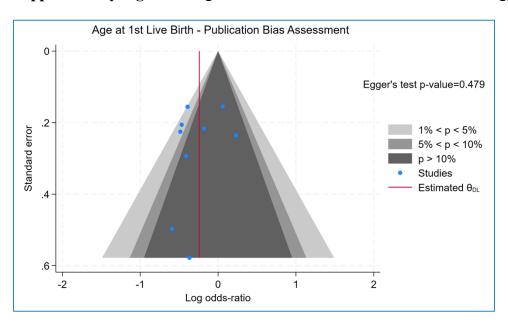
# Supplementary Figure 20: Duration of Breastfeeding - Contour Funnel Plot & Egger's test Assessment



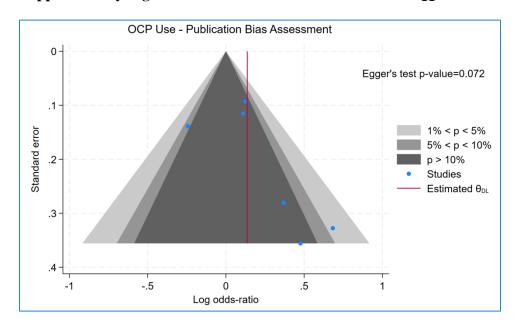
#### Supplementary Figure 21: Age at Menarche - Contour Funnel Plot & Egger's test Assessment



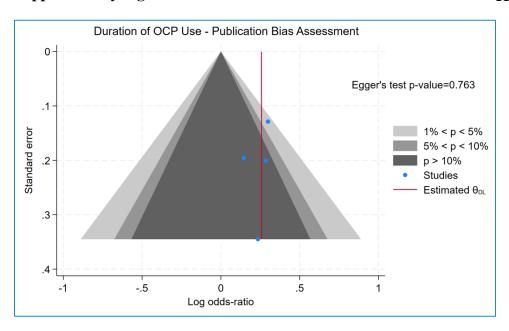
## Supplementary Figure 22: Age at 1st Live Birth - Contour Funnel Plot & Egger's test Assessment



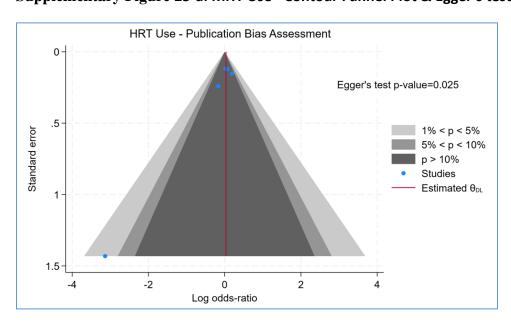
### **Supplementary Figure 23: OC Use - Contour Funnel Plot & Egger's test Assessment**



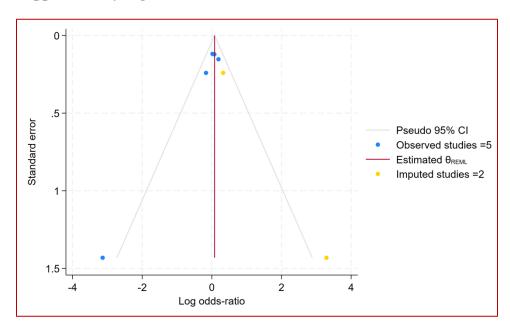
## Supplementary Figure 24: Duration of OC Use - Contour Funnel Plot & Egger's test Assessment



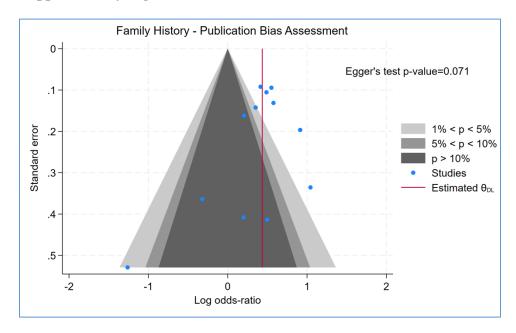
### Supplementary Figure 25-a: MHT Use - Contour Funnel Plot & Egger's test Assessment



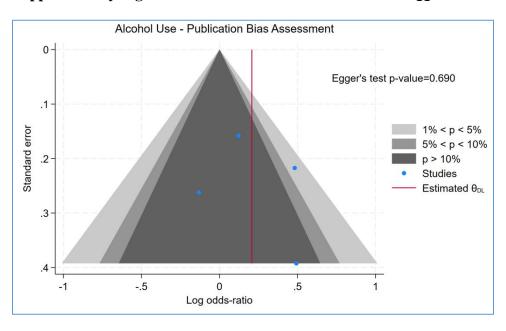
## Supplementary Figure 25-b: MHT Use – Trim and Fill Plot



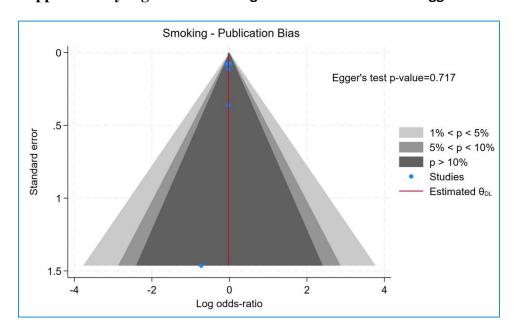
### Supplementary Figure 26: Family History - Contour Funnel Plot & Egger's test Assessment



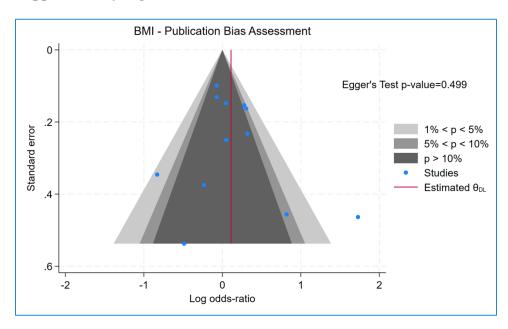
## Supplementary Figure 27: Alcohol - Contour Funnel Plot & Egger's test Assessment



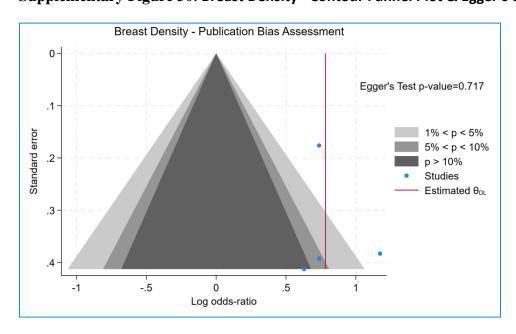
### Supplementary Figure 28: Smoking - Contour Funnel Plot & Egger's test Assessment



## Supplementary Figure 29: BMI - Contour Funnel Plot & Egger's test Assessment



## Supplementary Figure 30: Breast Density - Contour Funnel Plot & Egger's test Assessment



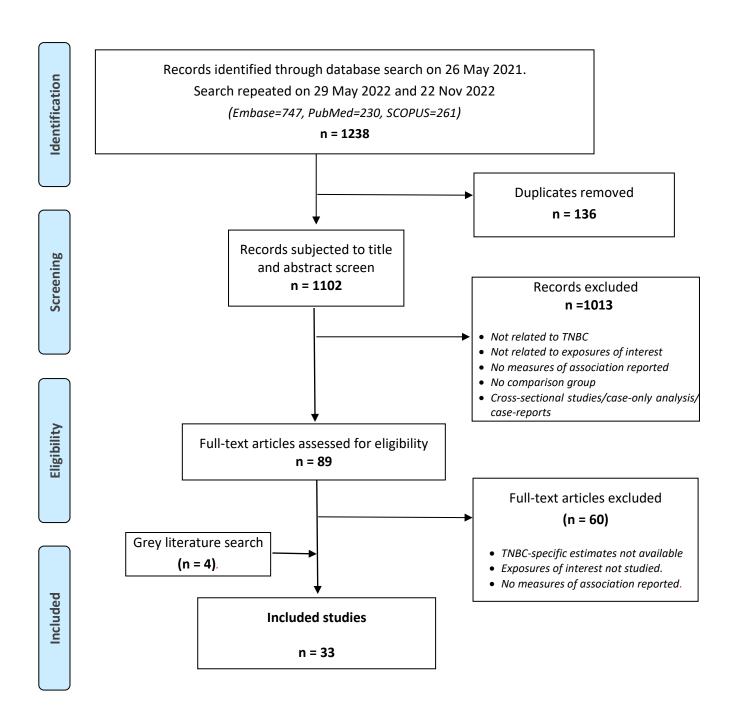
## **Supplementary Table 1: PRISMA Checklist**

#	Item	Guidance	On page #	Author Comments
Title	<u> </u>			<u> </u>
1	Title	Identify the report as a systematic review, or systematic review and meta-analysis, as appropriate.	Title page	
Abst	tract			
2	Structured summary	Provide a structured summary including, as applicable:	2	
Intro	oduction	-	•	
3	Rationale	Describe the rationale for the review in the context of what is already known.	3	
4	Objectives	Provide an explicit Population-Intervention-Comparator-Outcome-Study Design (PICOS) or Population-Exposure-Comparator-Outcome-Study Design (PECOS) statement as appropriate, detailing the following in relation to the research questions being asked:  • Participants • Interventions / Exposures (as appropriate) • Comparisons • Outcomes • Study design	3	
	hods			
5	Protocol and registratio n	Indicate if a review protocol exists, if and where it can be accessed (e.g. web address), and registration information including registration number (if available).	3	Protocol Regissstration number: PROSPERO 2021 CRD42021254 594
6	Eligibility criteria	Specify study characteristics (e.g. PICOS/PECOS, length of exposure) and report characteristics (e.g. years considered, language, publication status) used as criteria for eligibility, giving rationale.	4	

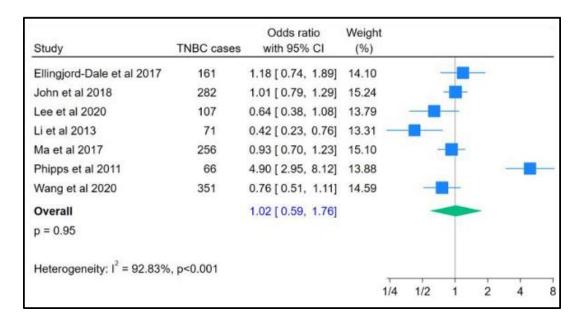
	l		T
7	Informatio	Describe all information sources (e.g. databases with dates of	3
	n sources	coverage, contact with study authors to identify additional	
		studies) in the search, and date last searched.	
8	Search	Present full electronic search strategy for at least one	3
		database, including any limits used, such that it could be	
		repeated.	
9	Study	State the process for selecting studies (i.e., screening,	4
	selection	eligibility, included in systematic review, and, if applicable,	
		included in the meta-analysis).	
10	Data	Describe method of data extraction from reports (e.g., piloted	5
10	collection	forms, independently, in duplicate) and any processes for	
11	process	obtaining and confirming data from investigators.	-
11	Data items	List and define all variables for which data were sought (e.g.,	5
		PICOS/PECOS, funding sources) and any assumptions and	
		simplifications made.	
12	Risk of bias	Describe methods used for assessing risk of bias of individual	5
	in	studies (including specification of whether this was done at the	
	individual	study or outcome level), and how this information is to be used	
	studies	in any data synthesis.	
13	Summary	State the principal summary measures (e.g., risk ratio,	5
13	measures	difference in means).	
1.1		·	5
14	Synthesis	Describe the methods of handling data and combining results	5
	of results	of studies, if done, including measures of consistency (e.g., I <sup>2</sup> )	
		for each meta-analysis.	
15	Risk of bias	Specify any assessment of risk of bias that may affect the	5
	across	cumulative evidence (e.g., publication bias, selective reporting	
	studies	within studies).	
16	Additional	Describe methods of additional analyses (e.g., sensitivity or	5
	analyses	subgroup analyses, meta-regression), if done, indicating which	
		were pre-specified.	
Resu	ults		
17	Study	Give numbers of studies screened, assessed for eligibility, and	6
-,	selection	included in the review, with reasons for exclusions at each	
	Selection	stage, illustrated with a PRISMA flow diagram.	
10	Ctudy	For each study, present in a summary table the characteristics	6
18	Study	for the second s	6
	characteris	for which data were extracted (e.g., study size, PICOS/PECOS,	
	tics	follow-up period) and provide the citations.	
19	Risk of bias	Present data on risk of bias of each study and, if available, any	6
	within	outcome level assessment (see item 12).	
	studies		
20	Results of	For all outcomes considered (benefits or harms), present, for	6 to 8
	individual	each study: (a) simple summary data for each intervention	
	studies	group (b) effect estimates and confidence intervals, ideally	
		with a forest plot (unless such a plot would be misleading)	
21	Synthesis	Present results of each meta-analysis done, including	6 to 8
	of results	confidence intervals and measures of consistency.	
22	Risk of bias	Present results of any assessment of risk of bias across studies	12
22			12
	across	(see Item 15).	
	studies		

23	Additional	Give results of additional analyses, if done (e.g., sensitivity or	6 to 8	
	analysis	subgroup analyses, meta-regression [see Item 16]).		
24	Summary	Summarize the main findings including the strength of	9	
	of	evidence for each main outcome; consider their relevance to		
	evidence	key groups (e.g., researchers, users, and policy makers).		
25	Limitations	Discuss limitations at study and outcome level (e.g., risk of	10 and 11	
		bias), and at review-level (e.g., incomplete retrieval of		
		identified research, reporting bias).		
26	Conclusion	Provide a general interpretation of the results in the context of	11	
	S	other evidence, and implications for future research.		
27	Funding	Describe sources of funding for the systematic review and	18	
		other support (e.g., supply of data); role of funders for the		
		systematic review.		

## Supplementary Figure 31: Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) Indicating Identification and Selection of Studies.



## Supplementary Figure 32: Odds of TNBC in those with >=12 months of breastfeeding vs. 0 months.



## Supplementary Figure 33: Odds of TNBC in those who ever used OC vs. those who never did.

