

These studies differentiate induced and spontaneous abortions

Total Studies = 76
Positive Association = 61
Statistically Significant = 41
Negative Association = 12
Statistically Significant = 4
Null (no effect) = 3

No.	Year	Reference	OR or HR (95% CI)	Statistically Significant	POS / NEG Association	Country/ Population
1	1957	Segi M, et al. An epidemiological study on cancer in Japan. GANN. 48 1957;1-63.	2.63 (1.85-3.75)	Yes	Positive	Japan
2	1968	Watanabe H, et al. Epidemiology and clinical aspects of breast cancer. [in Japanese], Nippon Rinsho 26, no. 8. 1968;1843-1849.	1.51 (0.91-2.53)		Positive	Japan
3	1978	Dvoyrin VV, et al. Role of women's reproductive status in the development of breast cancer. Methods and Progress in Breast cancer Epidemiology Research Tallin 1978;53-63.	1.71 (0.80-3.64)		Positive	USSR/ Estonia
4	1979	Burany B. Gestational characteristics in women with breast cancer. Jugosil Ginekol Opstet 1979;19:237- 47 (in Serbo-Croatian).	0.50 (0.33-0.74)	Yes	Negative	Yugoslavia
5	1981	Pike MC, et al. Oral contraceptive use and early abortion as risk factors for breast cancer in young women. Br J Cancer 43, no. 1. 1981;72-6.	2.37 (0.85-6.93)		Positive	United States
6	1982	Nishiyama, F. The epidemiology of breast cancer in Tokushima prefecture. Shikoku Ichi 1982; 38:333-43 (in Japanese).	2.52 (1.99-3.20)	Yes	Positive	Japan
7	1983	Brinton LA, et al. Reproductive factors in the etiology of breast cancer. Br J Cancer 47, no. 6. 1983:757- 762.	1.2 (0.6-2.3)		Positive	United States
8	1984	Le M-G, Bachelot A, et al. Oral contraceptive use and breast or cervical cancer: Preliminary results of a case-control study In: Wolff J-P, Scott JS, eds. Hormones and sexual factors in human cancer aetiology. Amsterdam: Elsevier 1984:139-47.	1.3 (0.97-1.77)		Positive	France
9	1985	Hirohata T, et al. Occurrence of breast cancer in relation to diet and reproductive history: a case-control study in Fukuoka, Japan. Natl Cancer Inst Monographs 69 1985:187-90.	1.52 (0.93-2.48)		Positive	Japan
10	1987	LaVecchia C, et al. General epidemiology of breast cancer in northern Italy. Intl J of Epidemiol. 1987;16 3:347-355.	1.19 (0.82-1.71)		Positive	Italy
11	1988	Ewertz M, et al. Risk of breast cancer in relation to reproductive factors in Denmark. Br J Cancer 58, no. 1 1988:99-104.	3.85 (1.08-13.6)	Yes	Positive	Denmark
12	1988	Luporsi E. (1988), in Andrieu N, Duffy SW, Rohan TE, Le MG, Luporsi E, Gerber M, Renaud R, Zaridze DG, Lifanova Y, Day NE. Familial risk, abortion and their interactive effect on the risk of breast cancer—a combined analysis of six case-control studies. Br J Cancer 1995;72:744-751.	1.8 (1.0-3.5)	Yes	Positive	France
13	1988	Zaridze DG. (1988) in Andrieu N, Duffy SW, Rohan TE, Le MG, Luporsi E, Gerber M, Renaud R, Zaridze DG, Lifanova Y, Day NE. Familial risk, abortion and their interactive effect on the risk of breast cancer—a combined analysis of six case-control studies. Br J Cancer 1995;72:744-751.	2.7 (0.7-10.3) if ≥ 2 figures IA 4.0 (2.1-7.8)	Yes	Positive	Russia
14	1988	Rosenberg L, et al. Breast cancer in relation to the occurrence and the time of the induced and spontaneous abortion. Amer J Epidemiol 127, no. 5 1988:981-989.	1.2 (1.0-1.6)	Yes	Positive	United States
15	1989	Harris BM, et al. Risk of cancer of the breast after legal abortion during first trimester: a Swedish register study. Br Medical J 299, no. 6713 1989:1430-2.	0.77 (0.58-0.99)	Yes	Negative	Norway/ Sweden
16	1989	Howe HL, et al. Early abortion and breast cancer risk among women under age 40. Intl J Epidemiol 18, no. 2 1989:300-4.	1.9 (1.2-3.0)	Yes	Positive	United States

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17	1989	Remennick L. Reproductive patterns in cancer incidence in women: A population based correlation study in the USSR. <i>Intl J Epidemiol</i> 1989 (18) 3:498-510.	data not in form of OR		Positive	USSR
18	1990	Adami HO, et al. Absence of association between reproductive variables and the risk of breast cancer in young women in Sweden and Norway. <i>Br J Cancer</i> 62, no. 1 1990:122-6	0.8 (0.5-1.1) [if ≥2IA 1.3 (0.6-3.0)]		Positive	Sweden/ Norway
19	1991	Parazzini F, et al. Spontaneous and induced abortions and risk of breast cancer. <i>Intl J Cancer</i> 48, no. 6 1991:816-20.	1.0 (0.8-1.3)		Null	Italy
20	1992	Parazinni F, et al. Menstrual and reproductive factors and breast cancer in women with family history of the disease. <i>Intl J of Cancer</i> vol 51 1992:677-681.	0.9 (0.8-1.1)		Negative	Italy
21	1993	Laing AE, et al. Breast cancer risk factors in African-American women: The Howard University tumor registry experience. <i>J Natl Med Assoc</i> 85 1993:931-939.	4.7 (2.6-8.4) if IA and diagnosed BC ≥50yo [1.5 (0.7-3.5) if BC ≤40yo]	Yes	Positive	United States
22	1993	La Vecchia C, et al. Long-term impact of reproductive factors on cancer risk. <i>Int J Cancer</i> 53, no. 2 1993:215-9.	1.0 p < 0.05		Null	Italy
23	1993	Moseson M, et al. The influence of medical conditions associated with hormones on the risk of breast cancer. <i>Int J Epidemiol</i> 1993;22:1000-9.	1.0 (0.7-1.4)		Null	United States
24	1994	Andrieu N, Clavel F, Gairard B, Piana L, Bremond A, Lansac J, Flamant R, Renaud R. Familial risk of breast cancer and abortion. <i>Cancer Detect Prevent</i> 1994;18(1):51-55.	1.2 (0.8-1.8)		Positive	France
25	1994	Daling JR, et al. Risk of breast cancer among young women: relationship to induced abortion. <i>J Natl Cancer Inst</i> 86, no. 21 1994;1584-92.	1.5 (1.2-1.9)	Yes	Positive	United States
26	1994	Laing AE, et al. Reproductive and lifestyle factors for breast cancer in African-American women. <i>Gent Epidemiol</i> 1994;11:A300.	2.4 (1.0-6.0)	Yes	Positive	United States
27	1994	White E, et al. Breast cancer among young US women in relation to oral contraceptive use. <i>J Natl Cancer Inst</i> 1994;86:505-14.	1.36 (1.11-1.67) [if IA before FFTP and nulliparous 1.7 (1.11-2.6)]	Yes	Positive	United States
28	1994	Andrieu N, Duffy SW, Rohan TE, Le MG, Luporsi E, Gerber M, Renaud R, Zaridze DG, Lifanova Y, Day NE. Familial risk, abortion and their interactive effect on the risk of breast cancer—a combined analysis of six case-control studies. <i>Br J Cancer</i> 1995;72:744-751.	1.5 (1.1-1.9)	Yes	Positive	Multi - National
29	1995	Brinton LA, et al. Oral contraceptives and breast cancer risk among younger women. <i>J Natl Cancer Inst</i> 1995;87:827-35.	[1.02 (0.8-1.4) if ≥ 2IA]		Positive	United States
30	1995	Bu L, et al. Risk of breast cancer associated with induced abortion in a population at low risk of breast cancer. <i>Amer J Epidemiol</i> 141 1995;S85.	2.9 (1.9-4.4) [if BrCa ≤ 35 yo 4.5 (1.9-10.7)] [if ≤ 2 IA 3.6 (2.2-6.0)]	Yes	Positive	China

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No.	Year	Reference	OR or HR (95% CI)	Statistically Significant	POS / NEG Association	Country/ Population
31	1995	Lipworth L, et al. Abortion and the risk of breast cancer: a case-control study in Greece. <i>Intl J Cancer</i> 61, no. 2 1995:181-4.	1.51 (1.24-1.84) [if IA before FFTP 2.06 (1.45-2.9)]	Yes	Positive	Greece
32	1995	Rookus MA, et al. Breast Cancer risk after an induced abortion, a Dutch case-control study. <i>Amer J Epidemiol</i> 1995;141:S54 (abstract 214).	1.9 (1.2-3.1)	Yes	Positive	Netherlands
33	1996	Daling JR, Brinton LA, Voigt LF, et al. Risk of breast cancer among white women following induced abortion. <i>Amer J Epidemiol</i> 1996;144:373-380.	1.3 (1.0-1.6)	Yes	Positive	United States
34	1996	Newcomb PA, et al. Pregnancy termination in relation to risk of breast cancer. <i>J Amer Med Assoc</i> 275, no. 4 1996:283-287.	1.23 (1.0-1.51)	Yes	Positive	United States
35	1996	Rookus MA, van Leeuwen FE. Induced abortion and risk for breast cancer: reporting (recall) bias in a Dutch case-control study. <i>J Natl Cancer Inst</i> 1996;88:1759-1764.	1.9 (1.1-3.2) [if before FTP 2.6 (1.0-6.8)]	Yes	Positive	Netherlands
36	1996	Talamini, R, et al. The role of reproductive and menstrual factors in cancer of the breast before and after menopause. <i>European J Cancer</i> 32, no. 2 1996:303-310.	1.2 (1.0-1.5) [if premenopausal BC 1.4 (1.0-2.0)]	Yes	Positive	Italy
37	1996	Tavani A, La Vecchia C, Franceschi S, Negri E, D'Avanzo B, Decarli A. Abortion and breast cancer risk. <i>Intl J Cancer</i> 1996;65:401-05.	1.2 (1.0-1.5)	Yes	Positive	Italy
38	1996	Wu AH, et al. Menstrual and reproductive factors and risk of breast cancer in Asian-Americans. <i>Br J Cancer</i> 73, no. 5 1996:680-6.	1.92 (0.7-5.3)		Positive	United States
39	1997	Melbye M, et al. Induced abortion and the risk of breast cancer. <i>N Engl J Med</i> 336, no. 2 1997:81-85.	1.38 (1.0-1.9) [if IA ≥ 12 week gestation [1.89 (1.11-3.22) ≥ 18 wks gestation]	Yes	Positive	Denmark
40	1997	Palmer J. Induced and spontaneous abortion in relation to risk of breast cancer. <i>Cancer Causes and Control</i> 8, no. 6 1997:841-849.	1.4 (0.9-2.2) if 1 IA nulliparous women [1.4 (1.0-1.8) if 1 IA parous women]		Positive	United States
41	1999	Fioretti F. Risk factors for breast cancer in nulliparous women. <i>Br J Cancer</i> 1999 78 (11/12) 1923-1928.	0.97 (0.64-1.47) [if IA ≥ 30 yo 1.75 (1.03-2.97)]	Yes	Positive	Italy
42	1999	Marcus, PM, et al. Adolescent reproductive events and subsequent breast cancer risk. <i>Amer J Public Health</i> 89, no. 8 1999:1244-1247.	1.3 (0.2-9.7) if IA nulliparous		Positive	United States
43	2000	Lazovich D, et al. Induced abortion and breast cancer risk. <i>Epidemiol</i> 11, no. 1 2000:76-80.	1.1 (0.7-1.7) [if IA nulliparous 1.7 (0.6-5.4)]		Positive	United States
44	2000	Newcomb, PA. A record-based evaluation of induced abortion and breast cancer risk. <i>Cancer Causes and Control</i> 11, no. 9 2000:777-781.	0.9 (0.5-1.6)		Negative	United States
45	2000	Tang M, et al. Induced abortion in relation to breast cancer among parous women: A birth certificate registry study. <i>Epidemiology Lippincott Williams &amp; Wilkins</i> 11, no. 2 2000:177-180.	0.9 (0.7-1.2)		Negative	United States

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No.	Year	Reference	OR or HR (95% CI)	Statistically Significant	POS / NEG Association	Country/ Population
46	2001	Goldacre MJ, et al. Abortion and breast cancer: a case-control record linkage study. <i>J Epidemiol &amp; Community Health</i> 55, no. 5 2001:336-7.	0.83 (0.74-0.93)	Yes	Negative	Britain
47	2001	Robertson C, et al. The association between induced and spontaneous abortion and risk of breast cancer in Slovenian women aged 25-54. <i>Breast</i> 2001;10:291-298.	2.71 (0.72-10.26) if IA nulliparous		Positive	Slovenia
48	2001	Sanderson M, et al. Abortion history and breast cancer risk: Results from the Shanghai Breast Cancer Study. <i>Intl J Cancer</i> 96, no. 6 2001:899-905.	1.3 (0.8-2.3) if IA ≥ 3 and post-menopausal BC		Positive	China
49	2002	Ye Z, et al. Breast cancer in relation to induced abortions in a cohort of Chinese women. <i>Br J Cancer</i> 87, no. 9. 2002:976.	1.06 (0.9-1.25) [if IA ≥ 13 wks 1.95 (0.83-4.56)] [if IA before FFTP 2.16 (0.79-5.91)]		Positive	China
50	2003	Becher H, Schmidt S, Chang-Claude J. Reproductive factors and familial predisposition for breast cancer by age 50 years. A Case control family study for assessing main effects and possible gene-environment interaction. <i>Intl J Epidemiol</i> 2003;32:38-50.	1.35 (1.03-1.78)	Yes	Positive	Germany
51	2003	Erlandsson G, et al. Abortions and breast cancer: record-based case-control study. <i>Intl J Cancer</i> 103, no. 5. 2003:676-9.	0.8 (0.63-1.02)		Negative	Sweden
52	2003	Mahue-Giangreco M, Ursin G, Sullivan-Halley J, Bernstein L. Induced abortion, miscarriage, and breast cancer risk of young women. <i>Cancer Epidemiol Biomarkers &amp; Prev</i> 2003;12:209-214.	1.05 (0.75-1.48)		Positive	United States
53	2003	Paoletti X, Clavel-Chapelon F. Induced and spontaneous abortion and breast cancer risk: results from the E3N cohort study. <i>Intl J Cancer</i> 106, no. 2 2003:270-6.	0.91 (0.82-0.99)		Negative	France
54	2004	Meeske K, et al. Impact of reproductive factors and lactation on breast carcinomas in situ. <i>Intl J Cancer</i> 2004 110:103-109.	1.04 (0.56-1.94)		Positive	United States
55	2004	Palmer JR, et al. A prospective study of induced abortion and breast cancer in African-American women. <i>Cancer Causes &amp; Control</i> 15, no. 2 2004:105-11.	1.1 (0.8-1.4) parous women [0.9 (0.5-1.4) nulliparous women]		Positive	United States
56	2005	Brewster DH. Risk of breast cancer after miscarriage or induced abortion: a Scottish record linkage case- control study. <i>J Epidemiol &amp; Community Health</i> 59, no. 4 2005:283-287.	0.8 (0.72-0.89)	Yes	Negative	Scotland
57	2006	Reeves GK. Breast cancer risk in relation to abortion: Results from the EPIC study. <i>Intl J Cancer</i> 119, no. 7 2006:1741-5.	0.95 (0.87-1.03) (8 countries: 4 with positive association)		Negative	Europe
58	2006	Rosenblatt K. Induced abortions and the risk of all cancers combined and site-specific cancers in Shanghai. <i>Cancer Causes and Control</i> 17, no. 10 2006:1275-1280.	1.01 (.92-1.12)		Positive	China
59	2006	Tehrani N, et al. The effect of abortion on the risk of breast cancer. Iranian study presented at a conference at McMaster University. Available at: <a href="http://www.hdl.handle.net/10755/163877">http://www.hdl.handle.net/10755/163877</a>	7.94 (2.05-26.21)	Yes	Positive	Iran
60	2007	Michels KB. Induced and spontaneous abortion and incidence of breast cancer among young women. <i>Archives of Internal Medicine</i> 167, no. 8 2007:814-820.	1.01 (0.88-1.87) if IA nulliparous		Negative	United States

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61	2007	Naieni K, et al. Risk factors of breast cancer in north of Iran: a case-control in Mazandaran Province. <i>Asian Pacific J Cancer Prev</i> 8, no. 3 2007:395-8.	1.62 (1.13-2.31)	Yes	Positive	Iran
62	2008	Henderson K. Incomplete pregnancy is not associated with breast cancer risk: the California Teachers Study. <i>Contraception</i> 77, no. 6 2008:391-396	0.98 (0.77-1.25) if nulliparous [1.08 (0.93-1.24) if parous]		Positive	United States
63	2008	Lin, J et al. A case control study on risk factors of breast cancer among women in Cixi. <i>Zhejiang Preventive Medicine</i> , vol. 20, no. 6 June 2008:3-5.	1.64 (1.06-2.52)	Yes	Positive	China
64	2009	Ozmen V, et al. Breast cancer risk factors in Turkish women--a University Hospital based nested case control study. <i>World J Surgical Oncology</i> 7, no. 37 2009.	1.66 (1.38-1.99)	Yes	Positive	United States
65	2009	Ozmen V, et al. Breast cancer risk factors in Turkish women--a University Hospital based nested case control study. <i>World J Surgical Oncology</i> 7, no. 37 2009.	1.66 (1.38-1.99)	Yes	Positive	Turkey
66	2009	Xing P, et al. A case-control study of reproductive factors associated with subtypes of breast cancer in Northeast China. <i>Medical Oncology</i> 2009.	1.26 (1.05-1.52) for luminal A breast cancer	Yes	Positive	China
67	2011	Khachatryan L, et al. Influence of diabetes mellitus type 2 and prolonged estrogen exposure on risk of breast cancer among women in Armenia. <i>Health Care for Women Intl</i> , no. 32 2011:953-971.	2.86 (1.02-8.04) [1.77 (1.0-3.12) if 1-3 IA]	Yes	Positive	Armenia
68	2011	Lodha RS, Nandeshwar S, Pal DK et al. Risk factors for breast cancer among women in Bhopal Urban Agglomerate: a case-control study. <i>Asian Pacific J Cancer Prev</i> 2011;12:2111-15	1.87 (0.83 -4.18)		Positive	India
69	2012	Jiang AR, et al. Abortions and breast cancer risk in premenopausal and postmenopausal women in Jiangsu Province of China. <i>Asian Pacific J Cancer Prev</i> 2012;13:33-35. Available at: <a href="#">Click here for link</a>	3≥ IAs 2.50 (1.41-4.42)	Yes	Positive	China
70	2012	Lecarpentier J, et al. Variation in breast cancer risk associated with factors related to pregnancies according to truncating mutation location, in the French National BRCA1 and BRCA2 mutations carrier cohort (GENEPSO). <i>Breast Cancer Research</i> 2012, 14:R99. Available at: <a href="http://breast-cancer-research.com/content/14/4/R99">http://breast-cancer-research.com/content/14/4/R99</a> .	IA before FFTP 1.7(1.19-2.63)	Yes	Positive	France
71	2012	Yanhua, C, et al. Reproductive Variables and Risk of Breast Malignant and Benign Tumours in Yunnan Province, China. <i>Asian Pacific J Cancer Prev</i> 2012;13, 2179-2184. Available at: <a href="#">Click here for link</a>	1 AB OR 2.5 (1.38-4.52) > 2 AB OR 12.31 (5.02-30.20)	Yes	Positive	China
72	2013	Brauner,C, et al. Induced abortion and breast cancer risk among parous women: A Danish cohort study. <i>Acta Obstetrica et Gynecologica Scandinavica</i> 2013. Available at: <a href="http://onlinelibrary.wiley.com/doi/10.1111/aogs.12107/abstract">http://onlinelibrary.wiley.com/doi/10.1111/aogs.12107/abstract</a>	0.95 (0.83-1.09)		Negative	Denmark

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No.	Year	Reference	OR or HR (95% CI)	Statistically Significant	POS / NEG Association	Country/ Population
73	2013	Jabeen S, et al. Breast cancer and some epidemiological risk factors: A hospital based study, J Dhaka Med Coll 2013;22(1)61-66.	20.62 CI (12.85-32.51)	Yes	Positive	Bangladesh
74	2013	Kamath R, et al. A study on risk factors of breast cancer among patients attending the tertiary care hospital in Udupi district. Indian J Community Med 2013;38(2)95-99. Available from: <a href="http://www.ijcm.org.in/text.asp?2013/38/2/95/112440">http://www.ijcm.org.in/text.asp?2013/38/2/95/112440</a>	0.95 6.38 (0.99-40.81)		Positive	India
75	2015	Ahmed K, Asaduzzaman S, Bashar MI, et al. Association assessment among risk factors and breast cancer in a low income country: Bangladesh. Asian Pacific J Cancer Prev 2015;16:7507-12	4.73 (2.07 10.83)	Yes	Positive	India
76	2016	Nagrani R, Mhatre S, Boffetta P et al. Understanding rural-urban differences in risk factors for breast cancer in an Indian population. Cancer Causes Control 2016;27:199-208. 2 or >2 IA	1.58( (1.15-2.16)	Yes	Positive	India

**Meta-Analyses**

No.	Year	Reference	OR or HR (95% CI)	Statistically Significant	POS / NEG Association	Country/ Population
1	1996	Brind J, et. al. Induced abortion as an independent risk factor for breast cancer: A comprehensive review and meta-analysis. J of Epidemiol Community Health 1996;50:481-496.	1.3 (1.2-1.4)	Yes	Positive	International
2	2004	Beral V, et. al. Collaborative group on hormonal factors in breast cancer, Breast cancer and abortion: collaborative reanalysis of data from 53 epidemiological studies, including 83,000 women with breast cancer from 16 countries. The Lancet 2004;363:1007-1016.	.93 (.89-.96)	Yes	Negative	International
3	2013	Huang, Yubei, et. al. A meta-analysis of the association between induced abortion and breast cancer risk among Chinese females. Cancer Causes Control. Accepted Nov 11, 2013. Available from: <a href="http://link.springer.com/article/10.1007%2Fs10552-013-0325-7">http://link.springer.com/article/10.1007%2Fs10552-013-0325-7</a>	One IA 1.44 95% (1.29-1.59) Two IA 1.76 95% (1.39-2.22) Three IA 1.89 95% (1.4-2.55)	Yes	Positive	China
4	2015	Guo J, Huang Y, Yang L et al. Association between abortion and breast cancer: An updated systematic review and meta-analysis based on prospective studies. Cancer Causes Control 2015;26:811-19. DOI 10.1007/s10552-015-0536-1 )	1.0 (.94-1.05)		Null	International
5	2018	Brind, J et al Induced Abortion as an Independent Risk Factor for Breast Cancer: A Systematic Review and Meta-analysis of Studies on South Asian Women Issues in Law & Medicine, Volume 33, Number 1, 2018	2.52 (1.67-3.75)	Yes	Positive	South Asia

**KEY**

**BC** - (Breast Cancer)

**FFTP** - (First Full Term Pregnancy)

**HR** – (Hazard Ratio)

**IA** – (Induced Abortion)

**Luminal A Cancer** – (Estrogen positive and HER2 negative)

**Null** – (No Effect)

**Nulliparous** – (Never given birth)

**Parous** – (Has given birth)

**OR** – (Odds Ratio)