

**Supplementary table 1** FHC ovarian cancers

	number	<i>BRCA1/2</i>	%BRCA	BRCA died	% BRCA died	non BRCA died	% non BRCA died	censored BC	RRM BRCA	% RRM BRCA
eligible BRRM at entry										
OC at entry	57	34	59.6%	17	50.0%	5	21.7%	4	2	5.9%
no OC at entry	32	23	71.9%	14	60.9%	3	33.3%	7	5	21.7%
not eligible BRRM at entry										
OC at entry	23	1	4.3%	1	100%	6	27.3%			
no OC at entry	12	3	25.0%	0	0.0%	3	33.3%			

A total of 124 women who were referred to the FHC had at some time a diagnosis of ovarian cancer. Eighty (64.5%) had a diagnosis before entry and 41/80 (51%) were  $\geq 2$  years from diagnosis. Five never attended the clinic and were not included in any analysis. Forty-four women were diagnosed 0.07-27 years post entry. Eighty-nine women were eligible for BRRM at entry with 32 (36%) being diagnosed after referral. Seventeen of 32 (53%) with ovarian cancer after entry have died 0.5-9 years post diagnosis including 14/22 (64%) *BRCA1/2* mutation carriers. Of the nine survivors who did not have a known *BRCA1/2* pathogenic variant 67% did not have a non-mucinous invasive epithelial cancer (3 had borderline, 2 mucinous and one a germ cell tumour). Five *BRCA1/2* mutation carriers have undergone BRRM with three before ovarian cancer diagnosis. Of those with an ovarian cancer diagnosis who were eligible based on risk for BRRM at entry Of those eligible with ovarian cancer at entry 17/34 (50%) have died 0.7-13.3 years post entry. Two *BRCA1/2* mutation carriers have undergone BRRM in the ovarian cancer at entry group. Of those not eligible for BRRM at entry who developed ovarian cancer 3/5 (60%) of those tested were *BRCA1/2* positive with three of the remaining seven having germ cell tumours. Of those not eligible only one BRCA carrier was later identified after death in a woman who did not attend clinic.

**Supplementary Table 2:** Follow up in women from families with *BRCA1/2* PVs identified after clinic entry

Mutation after entry	number	BRCA Positive	Negative	untested
Mutation after entry	497	242	174	81
RRM before PV found	28*	15*	12*	1*
RRM after PV	55	55	0	0
%RRM	16.7%	28.9%	6.9%	1.2%
%RRM no BC	20.3%	42.3%	7.8%	1.3%
BC before family PV	55*	52*	3*	0
Index tested positive	24*	16* Ovarian 8* unaffected	-	-
Died before family PV	2*	2*	0	-
Eligible for pre-symptomatic testing in those without BC or BRRM at family PV	388	149 (38.4%) 8* after BC	159 (41%) 1* after BC	80 (20.6%)
BC after family PV before individual testing	11	8*	1*	2
BC after individual testing	22	18	4	
% BC	17.7%	32.26%	4.6%	2.5%
%BC in those without BRRM after PV	8.2%	15.6%	3.1%	2.5%
*Censored for pre-symptomatic uptake				

RRM – risk reducing mastectomy, BC – breast cancer, PV – pathogenic variant

**Supplementary Table 3: Univariate associations with BRRM**

	RRM	Total	%	Cause specific RRM HR (95% CI)	Cause specific – other HR (95% CI)	SHR RRM HR (95% CI)	SHR other HR (95% CI)
Mother died BC <60	120	1120	10.71%	1.85 (1.50-2.29)	1.30 (1.04-1.65)	1.84 (1.49-2.27)	1.28 (1.01-1.61)
no maternal/sister death BC	302	5778	5.23%	Ref	Ref	Ref	Ref
Sister Died BC <50	37	336	11.01%	1.82 (1.30-2.57)	1.33 (0.93-1.91)	1.82 (1.29-2.57)	1.31 (0.91-1.88)
mother+sister death	8	39	20.51%				
nulliparous	91	1833	4.96%	Ref	Ref	Ref	Ref
Parous	357	4963	7.19%	1.38 (1.09-1.73)	1.30 (1.03-1.65)	1.38 (1.09-1.73)	1.28 (1.01-1.62)
no biopsy	396	6616	5.99%	Ref	Ref	Ref	Ref
Biopsy	55	579	9.50%	1.39 (1.04-1.84)	1.47 (0.07-0.31)	1.42 (1.07-1.88)	0.15 (0.07-0.31)
Age at entry <30	78	852	9.15%	Ref	Ref	Ref	Ref
Age at entry 30-39	244	3100	7.87%	0.88 (0.68-1.14)	1.85 (1.21-2.82)	0.87 (0.68-1.12)	1.84 (1.21-2.79 )
Age at entry 40-49	99	2285	4.33%	0.48 (0.36-0.64)	2.41 (1.58-3.68)	0.47 (0.35-0.63)	2.48 (1.63-3.77)
age at entry 50+	30	958	3.13%	0.38 (0.25-0.57)	3.53 (2.26-5.53)	0.36 (0.24-0.55)	3.63 (2.33-5.66)
Subtotal	451	7195					
era 1 <1994*	30	556	5.40%	Ref	Ref	Ref	Ref
era 2 1994-2003	164	2426	6.76%	1.30 (0.88-1.92)	0.63 (0.48-0.81)	1.30 (0.88-1.92)	0.62 (0.48-0.79)
era 4 2004-Apr 2013	190	2426	7.8%	1.78 (1.21-2.63)	0.50 (0.38-0.68)	1.77 (1.20-2.61)	0.47 (0.36-0.63)
May 2013-	67	1787	3.75%	1.61 (1.03-2.50)	0.20 (0.11-0.38)	1.61 (1.04-2.48)	0.18 (0.10-0.33)
Subtotal	451	7195					

BC- breast cancer, HR- hazard ratio, CI – confidence interval, SHR – subhazard ratio

**Supplementary table 4a:** Uptake in *BRCA1/2* carriers with pathogenic variant (PV) known at entry or after entry

	RRM		Competing risks (breast cancer/ death)	
	10 year	20 year	10 year	20 year
PV after entry	39.43 (31.44-48.62)	39.43 (31.44-48.62)	10.57 (6.23-17.62)	15.51 (8.58-27.14)
Known at entry	47.52 (41.66-53.76)	51.55 (44.89-58.57)	8.50 (5.58-12.82)	13.23 (8.99-19.26)
<b><i>BRCA1</i></b>				
PV after entry	35.76 (24.81-49.67)	35.76 (24.81-49.67)	9.05 (3.78-20.83)	9.05 (3.78-20.83)
Known at entry	50.63 (42.79-59.02)	56.29 (47.07-65.93)	8.47 (4.87-14.53)	15.77 (9.66-25.17)
<b><i>BRCA2</i></b>				
PV after entry	42.64 (31.82-55.36)	42.64 (31.82-55.36)	11.86 (6.09-22.42)	20.80 (9.87-40.74)
Known at entry	43.77 (35.31-53.27)	45.38 (36.64-55.14)	8.64 (4.54-16.13)	10.05 (5.45-18.14)

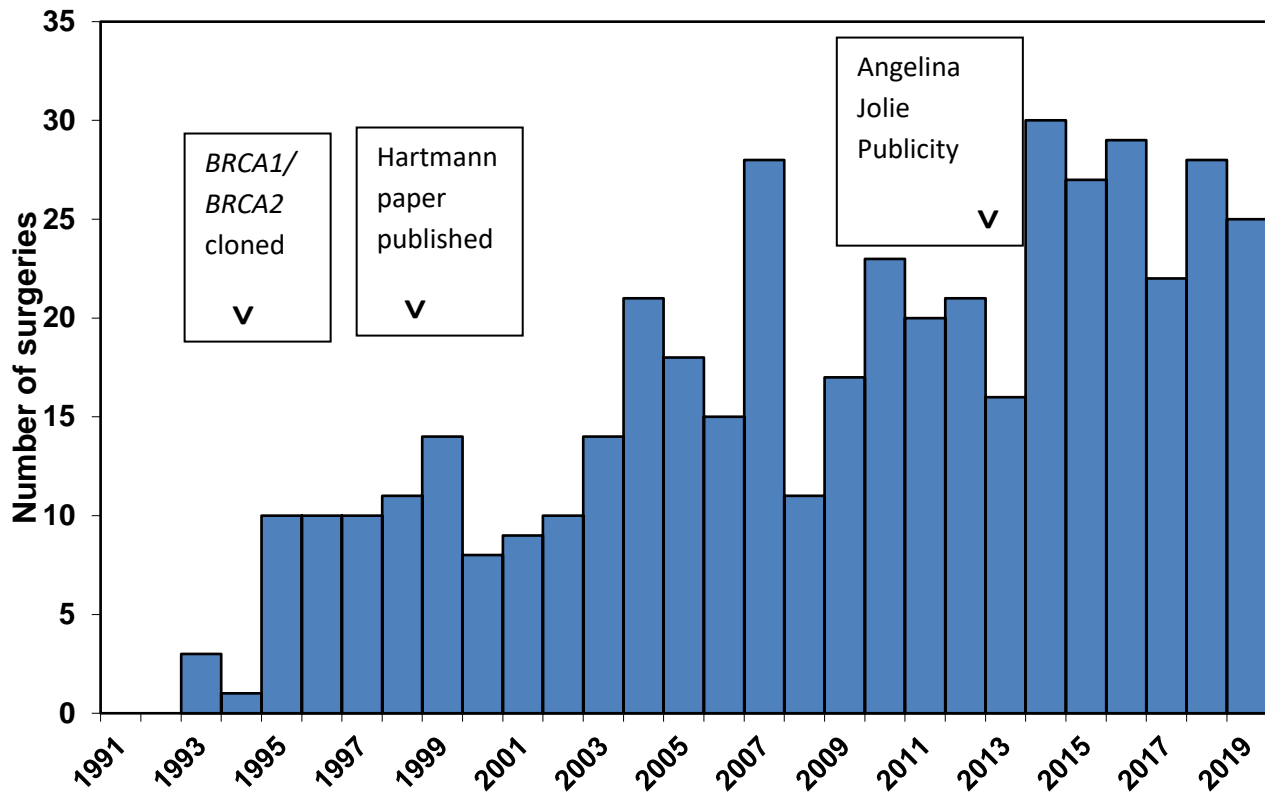
RRM – risk reducing mastectomy

**Supplementary table 4b:** Uptake in *BRCA1/2* carriers with PV known at entry or after entry

	Cause specific – RRM HR (95% CI)	Cause specific - other HR (95% CI)	RRM SHR (95% CI)	Other SHR (95% CI)
PV after entry	Ref		Ref	
Known at entry	1.19 (0.88-1.64)	0.60 (0.35-1.05)	1.30 (0.94-1.80)	0.56 (0.32-0.97)
<b><i>BRCA1</i></b>				
PV after entry	Ref		Ref	
Known at entry	1.55 (0.99-2.43)	0.83 (0.37-1.85)	1.62 (1.02-2.57)	0.83 (0.37-1.85)
<b><i>BRCA2</i></b>				
PV after entry	Ref		Ref	
Known at entry	0.90 (0.58–1.41)	0.37 (0.16-0.82)	1.02 (0.64 – 1.61)	0.38 (0.17-0.84)

RRM – risk reducing mastectomy, HR – hazard ratio, SHR – subhazard ratio

Supplementary Figure 1: BRRM surgeries per year in FHRPC from 1990-2019



Supplementary Figure 2: Cumulative incidence function (CIF) for a) RRM and b) other causes in BRCA1 families with known PV at entry and families with PVs found after entry

