

**Table S1** Frequency of Pathogenic and Likely Pathogenic variants among genes.

Gene	Total Individuals No. (%)	Affected Individuals No. (%)			Unaffected Individuals No. (%)		
		Breast Cancer	Colorectal Cancer	Ovarian Cancer	FH of Breast Cancer	FH of Colorectal Cancer	FH of Ovarian Cancer
<i>APC</i>	5/771 (0.6)	1/502 (0.2)	2/51 (3.9)	0/23(0.0)	0/72 (0.0)	2/22 (9.1)	0/19 (0.0)
<i>ATM</i>	14/1197 (1.2)	11/768 (1.4)	0/68 (0.0)	0/42 (0.0)	0/103 (0.0)	0/32 (0.0)	1/30 (3.3)
<i>BARD1</i>	5/1197 (0.4)	3/768 (0.4)	0/68 (0.0)	0/42 (0.0)	2/103 (1.9)	0/32 (0.0)	1/30 (3.3)
<i>BLM</i>	2/465 (0.4)	2/297 (0.7)	0/25 (0.0)	0/18 (0.0)	0/36 (0.0)	0/12 (0.0)	0/12 (0.0)
<i>BRCA1</i>	90/1197 (7.5)	70/768 (9.1)	2/68 (2.9)	6/42 (14.3)	3/103 (2.9)	2/32 (6.3)	1/30 (3.3)
<i>BRCA2</i>	36/1197 (3.0)	27/768 (3.5)	0/68 (0.0)	0/42 (0.0)	4/103 (3.9)	0/32 (0.0)	4/30 (13.3)
<i>BRIP1</i>	6/1197 (0.5)	4/768 (0.5)	1/68 (1.5)	0/42 (0.0)	1/103 (1.0)	1/32 (3.1)	1/30 (3.3)
<i>CHEK2</i>	30/1197 (2.5)	27/768 (3.5)	1/68 (1.5)	0/42 (0.0)	1/103 (1.0)	1/32 (3.1)	1/30 (3.3)
<i>EPCAM</i>	1/1197 (0.1)	0/768 (0.0)	1/68 (1.5)	0/42 (0.0)	0/103 (0.0)	0/32 (0.0)	0/30 (0.0)
<i>ABRAXAS1</i>	1/465 (0.2)	1/297 (0.3)	0/25 (0.0)	0/18 (0.0)	0/36 (0.0)	0/12 (0.0)	0/12 (0.0)
<i>MLH1</i>	5/1197 (0.4)	1/768 (0.1)	3/68 (4.4)	0/42 (0.0)	0/103 (0.0)	1/32 (3.1)	0/30 (0.0)
<i>MSH2</i>	5/1197 (0.4)	0/768 (0.0)	3/68 (4.4)	0/42 (0.0)	0/103 (0.0)	0/32 (0.0)	0/30 (0.0)
<i>MSH6</i>	5/1197 (0.4)	2/768 (0.3)	3/68 (4.4)	0/42 (0.0)	0/103 (0.0)	0/32 (0.0)	0/30 (0.0)
<i>MUTYH-monoallelic</i>	21/1197 (1.8)	11/768 (1.4)	5/68 (7.4)	0/42 (0.0)	1/103 (1.0)	0/32 (0.0)	0/30 (0.0)
<i>MUTYH-biallelic</i>	3/1197 (0.3)	0/768 (0.0)	3/68 (4.4)	0/42 (0.0)	0/103 (0.0)	0/32 (0.0)	0/30 (0.0)
<i>NBN</i>	6/1197 (0.5)	5/768 (0.7)	0/68 (0.0)	1/42 (2.4)	0/103 (0.0)	0/32 (0.0)	0/30 (0.0)
<i>NF1</i>	1/527 (0.2)	1/361 (0.3)	0/31 (0.0)	0/19 (0.0)	0/38 (0.0)	0/12 (0.0)	0/12 (0.0)
<i>PALB2</i>	20/1197 (1.7)	13/768 (1.7)	1/68 (1.5)	1/42 (2.4)	1/103 (1.0)	0/32 (0.0)	0/30 (0.0)
<i>PMS2</i>	6/1197 (0.5)	6/768 (0.8)	0/68 (0.0)	0/42 (0.0)	0/103 (0.0)	0/32 (0.0)	0/30 (0.0)
<i>PTEN</i>	1/1197 (0.1)	1/768 (0.1)	0/68 (0.0)	0/42 (0.0)	0/103 (0.0)	0/32 (0.0)	0/30 (0.0)
<i>RAD50</i>	11/1180 (0.9)	8/768 (1.0)	0/68 (0.0)	0/42 (0.0)	1/103 (1.0)	0/32 (0.0)	0/30 (0.0)
<i>RAD51B</i>	1/698 (0.1)	1/471 (0.2)	0/47 (0.0)	0/21 (0.0)	0/68 (0.0)	0/18 (0.0)	0/18 (0.0)
<i>RAD51C</i>	2/1197 (0.2)	2/768 (0.3)	0/68 (0.0)	0/42 (0.0)	0/103 (0.0)	0/32 (0.0)	0/30 (0.0)
<i>RET</i>	2/763 (0.3)	0/502 (0.0)	1/47 (2.1)	0/23 (0.0)	0/72 (0.0)	0/21 (0.0)	0/19 (0.0)
<i>STK11</i>	1/1197 (0.1)	0/768 (0.0)	0/68 (0.0)	0/42 (0.0)	0/103 (0.0)	0/32 (0.0)	0/30 (0.0)
<i>TP53</i>	6/1197 (0.5)	5/768 (0.7)	0/68 (0.0)	0/42 (0.0)	0/103 (0.0)	0/32(0.0)	0/30 (0.0)
<i>VHL</i>	1/763 (0.0)	0/502 (0.0)	0/47 (0.0)	0/23 (0.0)	0/72 (0.0)	0/21 (0.0)	0/19 (0.0)
<i>XRCC2</i>	1/465 (0.2)	1/297 (0.3)	0/25 (0.0)	0/18 (0.0)	0/36 (0.0)	0/12 (0.0)	0/12 (0.0)