

# Supplementary File

Title: Cost-Effectiveness Analysis from a Randomized Controlled Trial of Tailored Exercise Prescription for Women with Breast Cancer with 8-Year Follow Up

**Table S1.** Detail of intervention delivery costs.

Personnel	Details & Sources	Lower	Average	Upper
EP visits: AEP: Professional Staff, HEW 5, Level 3, casual (source: QUT)	\$45.77/hour, 20 hours/participant: includes exercise sessions 16 each, reporting, follow-up <a href="http://www2.qut.edu.au/jobs/working-at-qut/docs/Salary%20Scales%20Professional%20Staff.pdf">http://www2.qut.edu.au/jobs/working-at-qut/docs/Salary%20Scales%20Professional%20Staff.pdf</a>		915.40	
Admin Staff : Professional Staff, HEW 4, Level 1, casual (source: QUT)	\$39.57/hour, 3.5 hours/week for 16 weeks = 56 hours for 134 participants / estimated as 0.5–1 hour for per participant	19.79	29.68	39.57
EP visits using MBS item(government as the payer)	10 visits *item 10953*\$62.25 + care plan(721+723) *2		1139.60	
Intervention Materials	Details	Lower	Average	Upper
Workbook, Tracker, CMF (pack)	Officework Printing service (2018) 1/participant <a href="https://www.officeworks.com.au/resources/pdfs/guides/print-and-copy_price-guide.pdf">https://www.officeworks.com.au/resources/pdfs/guides/print-and-copy_price-guide.pdf</a>			
Educational Workbook	54 colour pages on double sided 100 gsm, A4 \$0.23-\$0.69 per side	12.42	14.15	15.87
Exercise Tracker	2 colour pages on double sided 100 gsm, A4\$0.23-\$0.69 per side	0.46	0.92	1.38
Case Management Folder	33 black and white pages on double sided 100 gsm, A4 *\$0.04-\$0.10	1.32	2.31	3.3
Total		14.20	17.38	20.55
Resources and other	Details			
Equipment/Clothes purchased by patients	\$40.46 per patient / 8months * inflation Gordon et al. 2017		42.40	
Intervention delivery	Intervention delivery			
Office rental	\$10/sq m per week x 15 sq m for 8 months (34.66 weeks) * inflation from 2014 (4.97%) divided by 67 participants Gordon et al. 2017		81.32	
Mobile plan	Telephone calls for follow-up, reminders, etc. \$50-\$100 per month *8months/50 participants	8.00	12.00	16.00
	2018	low	1322.38	high
	CPI inflation to 2019 = 1.61% to bring to 2019 dollars with ±10% low and high values	1209.30	1343.67	1478.03

**Table S2.** Productivity losses, end-of-life healthcare costs, and out-of-pocket costs.

Items	Note	Costs		
		Early stage	Locoregional Recurrence	Metastasis
Productivity losses - households / carers				
Household work time loss—Hours worked by Household; hours worked prior to cancer diagnosis—post-treatment2016, Deloitte report ,Financial impacts of breast cancer in Australia		2.00	27.00	52.00
Household productivity loss (per week) Work time loss* average wage Locoregional is average of no recurrence (profile 1) and metastasis (profile 5)		79.77	1076.87	2073.98
	Approx 90.9% of EfH participants were under 65 working age	72.51	978.88	1885.25
	74.5% of women are in the work force	54.02	729.26	1404.51
	54.5% work FT	29.44	397.45	765.46
	plus 45.5% work PT (assume 50%)	41.73	563.36	1084.98
Households' productivity loss (annual )	10%	\$2169.97	\$29,294.54	\$56,419.12
	Low 10%	\$1952.97	\$26,365.09	\$50,777.21
	High 10%	\$2386.96	\$32,224.00	\$62,061.04
Average Salary\$1515.60/week ,full-time work load,2016 ABS #6306 <a href="https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/6306.0Main+Features1May%202018?OpenDocument">https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/6306.0Main+Features1May%202018?OpenDocument</a>	Average hourly rate=weekly rate/38 hour	39.88		
Productivity losses - Individuals				
Patients' productivity loss (hrs per week) Survivors: hours worked prior to cancer diagnosis - post-treatment; Recurrence: hours worked prior to cancer diagnosis - during treatment 2016, Deloitte report ,Financial impacts of breast cancer in Australia	Survivors: Urban:28–16 = 14hours, Non-urban: 25–3 = 22 hours; Recurrence: Urban:28–0 = 28hours, Non-urban: 25–0 = 25 hours;	10.00	21.00	32.00
Patients' productivity loss (annual) Work time loss* average wage Locoregional is average of no recurrence (profile 1) and metastasis (profile 5)		398.84	837.57	1276.29
	Approx 90.9% of EfH participants were under 65 working age	362.55	761.35	1160.15
ABS 2020	74.5% of women are in the work force	270.10	567.21	864.31

Items	Note	Costs		
	54.5% work FT	147.20	309.13	471.05
	plus 45.5% work PT (assume 50%)	208.65	438.17	667.68
Subtotal	10%	\$10,849.83	\$22,784.65	\$34,719.46
	Low 10%	\$9764.85	\$20,506.18	\$31,247.51
	High 10%	\$11,934.81	\$25,063.11	\$38,191.41
	Applies to less than 65 years old			
<b>End-of-life healthcare costs</b>		Average	Lower	Upper
Last six months of life, these costs accrue, based on Australian data linkage study Reeve et al. 2018 (adjusted to 2017 AUD)	Cancer cohort	\$25,475.47	\$22,927.92	\$28,023.02
	Comparison cohort - non cancer	\$12,122.00	\$10,909.80	\$13,334.20
<a href="https://www.rba.gov.au/statistics/historical-data.html#exchange-rates">https://www.rba.gov.au/statistics/historical-data.html#exchange-rates</a>	From 2010-2019RBA inflation calculator	19.8%		
			10%	
<b>Lost income due to premature death</b>		2019	Lower	Upper
Individual productivity loss Carter 2016	Applies to less than 65 years old	\$149,909	\$134,918.46	\$164,900.34
<a href="https://www.rba.gov.au/calculator/annualDecimal.html">https://www.rba.gov.au/calculator/annualDecimal.html</a>	RBA inflation calculator	5.57%		
<b>Out of pocket costs due to breast cancer</b>				
Costs for two year period where most OOPs accrue, Deloitte Access Economics report 2016, found molecular profile did not sign change costs in stage I-III--2016, Deloitte report ,Financial impacts of breast cancer in Australia		2019		
	2 years	\$5076.86	\$1594.11	\$18,158.04
	Convert to 1 year	\$2538.43	\$797.05	\$9079.02
	This cost for 2 years then 25% of cost thereafter			

**Table S3.** Costs for recurrence of breast cancer.

	Probabil ity	Costs	Costs (2018 AUD)	Total Costs	Sources	
Local Recurrence						
Inpatient major surgical procedure AR-DRG(6393.00)	100%	6393	7160.16	7160.16	Verry et al. 2012	Inflated 2011–2018
Radiotherapy (13%)- 13% of local recurrence patients receive radiotherapy	13%	5171.75	5792.36	753.0068		
Radiotherapy costs include an initial and follow-up consultation, computed tomography planning and megavoltage – three fields (breast, boost and axilla) for 6 weeks						
Specialist visits *4 - item 104(85.55)*4	100%		342.2	342.2		
GP visits*4 - item 36(71.7)*4	100%		286.8	286.8		
Total				8542.1668	Lower	Upper
			2018 to 2019	\$8678.84	\$7810.96	\$9546.73
Distant metastases (annual)						
Inpatient procedure*3 (70%) 70% receive procedure	70%	5190.33	5813.1696	12207.656 16		
Third-generation chemotherapy (100%)(MBS, PBS)	100%	5419.06	6069.3472	6069.3472		
Fourth-generation chemotherapy (50%)50% receive	50%	15172.3	16992.9872	8496.4936		
Specialist visits*2- item 104(85.55)*2	100%		171.1	171.1		
GP visits *4 - item 36(71.7)*4	100%		286.8	286.8		
Total				27231.396 96	Lower	Upper
				\$27,667.10	\$24,900.39	\$30,433.81

**Table S4.** Follow-up schedule.

Frequency		Costs		
		lower	medium	upper
Year 1–2				
Specialist Visits	3–6 months	171.1	256.65	342.2
GP visits	3–6 months	143.4	215.1	286.8
Mammography	annually	71.6	\$89.50	107.4
Total		386.1	561.25	736.4
Year 3–5				
Specialist Visits	6–12 months	85.55	128.325	171.1
GP visits	6–12 months	71.7	107.55	143.4

Mammography	annually	71.6	\$89.50	107.4
Total		228.85	325.375	421.9
After year 5				
Specialist Visits	annually	68.44	85.55	102.66
GP visits	annually	57.36	71.7	86.04
Mammography	annually	71.6	\$89.50	107.4
Total		197.4	246.75	296.1

**Table S5.** Probability of local and distant recurrence.

	Prob	Rate	1-year prob	10% low	10% high	Source
Local Recurrence - 6.9year follow-up	0.04411 8	0.00653919 4	0.0065179	0.00586607 4	0.00716964 5	Wu et al. 2016; retrospective, 1088 records, 6.9y follow-up, Canada
Distant Recurrence 6.9year follow-up	0.11580 9	0.01783796 8	0.017680	0.01591183 2	0.01944779 4	

**Table S6.** Probability of locoregional disease progressing to distant disease.

	Disease free prob	Prog prob	Rate	1-year prob	10% low	10% high	Sources
Positive nodes	0.514	0.486	0.133106403	0.124628	0.112165	0.137091	Wapnir 2006
Negative nodes	0.669	0.331	0.080394244	0.077248	0.069523	0.084972	Anderson 2009
57% had negative in study	0.5915	0.4085	0.105018719	0.099692	0.089723	0.109662	

**Table S7.** Survival rates from breast cancer by stage.

	Survival Prob	Mortality Prob	Rate	1-year Prob	10% low	10% high	Sources
Locoregional Recurrence—10 year	49.0%	51.000%	0.07133498 9	0.068850	0.06196 5	0.075735	Witteveen et al. paper; Netherland;2014 <a href="https://seer.cancer.gov/statfacts/html/breast.html">https://seer.cancer.gov/statfacts/html/breast.html</a>
Distant Recurrence—5 year	27.0%	73.000%	0.26186666 4	0.230386	0.20734 8	0.253425	

**Table S8.** Mortality and recurrence rates for exercise and usual care groups (source EfH trial).

RR for exercise program Survival (measured by mortality)	EfH results	8-year probability	Rate	1-year probability
Overall mortality—usual care	15/130	0.115384615	0.014771364	0.014663
Overall mortality—exercise	11/207	0.053140097	0.006578811	0.006557
Non-breast cancer Death—Usual Care	5/130	0.038461538	0.004725387	0.004714

	low 95% CI	0.0126	0.001527717	0.001527
	high 95% CI	0.0875	0.011032192	0.010972
Non-breast cancer Death—Exercise	1/207	0.004830918	0.000583449	0.000583
	low 95% CI	0.0001	1.20488E-05	0.000012
	high 95% CI	0.0266	0.003248215	0.003243
Breast cancer Death—Usual Care	10/130	0.076923077	0.009643700	0.009597
	low 95% CI	0.0375	0.004604965	0.004594
	high 95% CI	0.1369	0.017737918	0.017582
Breast cancer Death—Exercise	10/207	0.048309179	0.005965670	0.005948
	low 95% CI	0.0234	0.002852786	0.002849
	high 95% CI	0.087	0.010966193	0.010906
Applied in model up to 8 years thereafter usual all cause death				
			7.96154	2.074622255
<b>Recurrence rates between Exercise and UC groups</b>				
Disease free survival		8-year probability	Rate	1-year probability
Recurrence—Exercise group	12/207	0.057971014	0.007195089	0.007169
	low 95% CI	0.0303	0.003707052	0.003700
	high 95% CI	0.0991	0.012573616	0.012495
Recurrence—Usual care	8/130	0.061538462	0.007652218	0.007623
	low 95% CI	0.0269	0.003285353	0.003280
	high 95% CI	0.1177	0.015087126	0.014974

**Table S9. Probability of death by age (female)** <https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3302.0.55.0012016-2018?OpenDocument>.

Age	Prob Death	Age	Prob Death	Age	Prob Death	Age	Prob Death
0	0.003025414	25	0.000239971	50	0.001788399	75	0.016630166
1	0.000229974	26	0.000259966	51	0.001968061	76	0.018594941
2	0.000119993	27	0.000269964	52	0.002127733	77	0.020937698
3	0.000099995	28	0.000279961	53	0.002307334	78	0.023724053
4	0.000089996	29	0.000299955	54	0.002496878	79	0.02677502
5	0.000079997	30	0.000329946	55	0.002686385	80	0.030369298
6	0.000069998	31	0.000369932	56	0.002875857	81	0.034635955
7	0.000059998	32	0.00039992	57	0.0030952	82	0.039527569
8	0.000059998	33	0.000429908	58	0.003374294	83	0.045063087
9	0.000059998	34	0.000479885	59	0.00365331	84	0.051724304
10	0.000059998	35	0.000519865	60	0.003982051	85	0.059101491
11	0.000069998	36	0.000549849	61	0.004310682	86	0.067298439

