### 6<sup>th</sup> December 2021

## IRIS (Identification & Referral to Improve Safety)

## Cost Effectiveness Analysis (CEA) Tool

Dr Estela Barbosa, Data Scientist at IRISi Gill Smallwood, Chief Executive at Fortalice in Bolton Dr Clare Ronalds, FRCGP, former Clinical Lead in Manchester





## **CEA tool motivation**

NIHR (National Institute for Health Research) funded research for the evaluation of the IRIS Programme in commissioned settings (outside RCTs):

- Markov Model or transition probability model
- Published in the BMJ Open -
- Outstanding results: programme was **CHEAPER and BETTER**
- NICE (National Institute for Health & Care Exc recommendation would be full implementation across the NHS



**BMJ Open** Cost-effectiveness of a domestic violence and abuse training and support programme in primary care in the real world: updated modelling based on an MRC phase IV observational pragmatic implementation study

Estela Capelas Barbosa,<sup>1</sup> Talitha Irene Verhoef,<sup>1</sup> Steve Morris,<sup>1</sup> Francesca Solmi,<sup>2</sup> Medina Johnson,<sup>3</sup> Alex Sohal,<sup>4</sup> Farah El-Shogri,<sup>4</sup> Susanna Dowrick,<sup>4</sup> Clare Ronalds,<sup>5</sup> Chris Griffiths,<sup>4</sup> Sandra Elridge,<sup>4</sup> Natalia V Lewis,<sup>4</sup> Angela Devine,<sup>7,8</sup> Anne Spencer,<sup>9</sup> Gene Feder<sup>10</sup>

To cite: Barbosa EC, Verhoe Morris S, et al. Cost-effectiveness of a domestic violence and abuse training

Objectives To evaluate the cost-effectiveness of the implementation of the Identification and Referral to Improve Safety (RIS) programme using up-to-date real-world information on costs and effectiveness fro routine clinical practice. A Markov model was constru to estimate mean costs and quality-adjusted life-years (0ALYs) of IRIS versus usual care per woman registered at a general practice from a societal and health service perspective with a 10-user time between perspective with a 10-year time horizon. Design and setting Cost-utility analysis in UK gener practices, including data from six sites which have be

nd it to be cost-effective. As a result, the IRIS nterval -£151 to £37) and produced 1 per woman (95% uncertainty interv

tive in 61% of simulations

ese results, reflected in the large uncertainty intervals

The lifetime prevalence or united and abuse (DVA) against women, in and abuse (DVA) against women, in a superfluing, coercive, three superfluing coercive, three superflui viour, violence and abuse, as well ionally fr 15% to 71%.2 In the UK, in the year endin March 2017, 7.5% of women (1.2millio experienced domestic abuse.3 Women who ence DVA suffer chronic health prob including gynaecological problem <sup>4-7</sup> In 2012, the cost of DVA in the UK, including medical





## CEA tool design: Markov Model

#### The evaluation model was robust, but not designed to be user friendly... Distribution Probabilistic

Analysis type

		Discount rate	uiscount	0.017	0.017	0.017	-
		Proportion of women experiencing abuse, last year	pAbuse	0.067	0.067	0.058	Beta
A B C D E F G	H I J K L						
IRIS Economic Evaluation - national		Start distribution					
Based on the model of Angela Devine		Proportion abuse: identified and seeing advocate	pAbuseADV	0.003	0.003	0.002	Uniform
		Proportion abuse: identified not seeing advocate	pAbuseID	0.033	0.033	0.032	Uniform
RESULTS TOTAL COHORT - 10 YEARS							
Discounted		Transition probabilities (6 months)					
Losis UALYS Costs Costs	QALYS	No abuse to Abuse Unidentified	pNAtoAU	0.0037	0.0037	0.0094	Dirichlet
Intervention         E21,307,323         07,033         Intervention         E23,200,323           Control         £21,885,781         67,877         Control         £25,563,6	511 79,284	No abuse to Dead	pNAtoDead	0.0055	0.0055	0.0151	Dirichlet
Increment -£297,856 22 Increment -£383,24	49 28						
D ICER -£13,358 per QALY gained ICER -£13,64	0 per QALY gained Parameters	Abuse Unidentified to No Abuse (control)	pAUtoNA	0.0500	0.0500	0.0495	Dirichlet
1		Abuse Unidentified to Identified not seeing advocate (control)	pAUtoID	0.0027	0.0027	0.0031	Dirichlet
		Abuse Unidentified to Identified and seeing advocate (control)	pAUtoADV	0.0005	0.0005	0.0003	Dirichlet
Discounted Undiscounted	Probabilistic analysis?	Abuse Unidentified to dead (control)	pAUtoDead	0.0055	0.0055	0.0069	Dirichlet
Costs QALYs Costs	QALYs		priotoboud	0.0000	0.0000	010000	Difference
intervention £2,158.79 6.790 Intervention £2,518	3 7.931 Discount rate	Abuse Unidentified to No Abuse (intervention)	nAlltoNA i	0.0500	0.0500	0.0507	Dirichlet
Control         £2,188.58         6.788         Control         £2,556	5 7.928 Proportion of women experiencing abuse, last year	Abuse Unidentified to Identified not seeing advocate (intervention)	nAlltolD i	0.0109	0.0109	0.0099	Dirichlet
increment -£30 0.002 increment -£38	0.003	Abuse Unidentified to Identified and seeing advocate (intervention)	pAUtoADV i	0.0056	0.0056	0.0063	Dirichlet
TER -E13,358 per QALT ganed TER -E13,64	Start distribution  Start distribution  Broportion aburguidentified and cooling advocate	Abuse Unidentified to dead (intervention)	pAUtoADV_I	0.0055	0.0055	0.0055	Dirichlet
NMB (WTP=£20,000) £74.38	Proportion abuse: identified not seeing advocate	Abuse of identified to dead (intervention)	pAotoDeau_i	0.0055	0.0035	0.0035	Dificilier
	A	Abuse Identified and series educes to Mr. Abuse		0.1408	0.1408	0.1596	Disisklat
RESULTS PER WOMAN - 1 YEAR	Transition probabilities (6 months)	Abuse Identified and seeing advocate to No Abuse	PADVIONA	0.1408	0.1408	0.1586	Dirichlet
Discounted Undiscounted	No abuse to Abuse Unidentified	Abuse identified and seeing advocate to dead	pADvtoDead	0.0055	0.0055	0.0143	Dirichlet
Losis QALYS Costs	0.793						
Control         £219         0.679         Control         £256	0.793 Abuse Unidentified to No Abuse (control)	Abuse Identified not seeing advocate to No Abuse	pIDtoNA	0.0781	0.0781	0.0505	Dirichlet
Increment -£3 0.000 Increment -£4	0,000 Abuse Unidentified to Identified and seeing advocate (con	Abuse Identified not seeing advocate to dead	pIDtoDead	0.0055	0.0055	0.0348	Dirichlet
ICER -£13,358 per QALY gained ICER -£13,64	0 per QALY gained Abuse Unidentified to dead (control)						
		Quality of life					
	Abuse Unidentified to No Abuse (intervention)	Utility No abuse	uNA	0.850	0.85	0.859	Beta
	Abuse Unidentified to identified not seeing advocate (inte Abuse Unidentified to identified and seeing advocate (inte	Utility Abuse unidentified	uAU	0.630	0.63	0.663	Beta
	Abuse Unidentified to dead (intervention)	Utility Identified and seeing advocate	uADV	0.650	0.65	0.712	Beta
PROBABILISTIC RESULTS - RESULTS PER WOMAN - 10 YEARS - DISCOUNTED	Alternative states and and and and an alternative state bits alternative	Utility Identified not seeing advocate	uID	0.630	0.63	0.747	Beta
	Abuse Identified and seeing advocate to No Abuse Abuse Identified and seeing advocate to dead						
Average 95% CI	041.94	Costs					
Costs Oct 5 Costs	Abuse Identified not seeing advocate to No Abuse	Costs per woman registered, per 6 months	cIntervention_pp	£0.32	£0.32	£0.25	Gamma
Control £2,634 6.655 Control £55 to £10	Abuse Identified not seeing advocate to dead	Cost of onward referral, once	cOnwardReferral	£306	£306	£147	Gamma
Increment -£58 -0.001 Increment £-381 to £	E67 -0.015 to 0.013 Quality of life	Cost of Abuse Unidentified, per 6 months	cAU	£1,999	£1,999	£879	Gamma
ICER £16 per QALY gained ICER £-14	4412 to £199471 Utility No abuse	Weight costs abuse identified and seeing advocate	wADV	1.00	1	1.19	Uniform
	Utility Abuse unidentified Utility Identified and seeing advocate	Weight costs abuse identified not seeing advocate	wID	1.00	1	0.93	Uniform
	Utility Identified not seeing advocate	Total costs for the intervention, per 6 months	cIntervention	£23,935			
		No Abuse, per 6 months	cNA	£0			
COST-EFFECTIVENESS ACCEPTABILITY CURVE	Costs	Identified and seeing advocate, per 6 months	cADV	£1,999			
	Cost of onward referral, once	Identified not seeing advocate, per 6 months	cID	£1,999			
100%	Cost of Abuse Unidentified, per 6 months						
90% -	Weight costs abuse identified and seeing advocate	General numbers					
<b>3</b> 80% -	Total costs for the intervention, per 6 months	Number of women registered in South Glos practices	nSouthGlos	101271			
	No Abuse, per 6 months	Number of women registered in IRIS practices (control)	nIRIS control	73347			
Willingness to pay threshold Probability	Identified and seeing advocate, per 6 months	Number of women registered in IRIS practices (intervention)	nIRIS intervention	70521			
£0 73% 8 60% -	identified not seeing advocate, per 6 months	Average number of women in 25 GP practices	nGP	75000			
£10,000 64% g 50% -	General numbers						
£15,000 61% <b>‡</b> 40%	Number of women registered in South Glos practices	Analysis					
£20,000 59%	Number of women registered in IRIS practices (control) Number of women registered in IRIS practices (intervention	Number of women in cohort	cohort	10000			
£25,000 57%	Average number of women in 25 GP practices			10000			
£30,000 56% <b>£</b> 20%	2000 20	Start distribution					
Markov Model Parameters Results PSA USA Steady S	Analysis Marko Number of women in cohort	Start distribution	n Abus n Al I	0.064			
For the steady s	Williber of Women in conorc	Proportion abuse: Unidentified	Danuseati	DOA			
	Start distribution	Markov Model Parameters	Results	PSA U	SA	Steady Sta	es Mark
	Proportion abuse unidentified		Markov (Oantral)	Markey	ation) ···	it agente	ASSUMING DASPO DO SUSO
	Markov Model Paramete	rs Hesuits PSA USA Steady States	Markov (Control)	Markov (Interven	nion) Un	It costs Lit	erature +



Lower limit	Upper limit	SE	Alpha	Beta	Total	Dirichlet	Source
0.000	0.030	-	-	-	-	-	NICE guide to methods 2013
							<b>-</b>
0.053	0.084	0.008	67	933	1000	-	ONS Crime Survey for Englan
							Scenario analysis using: Rich
0.00	0.0066	-			-	-	Assumption based on stead
0.00	0.066	-	-	-	-	-	Assumption based on stead
							_ ·
0.0004	0.0106	0.0025	2	498	500	5	Adjusted as necessary using
0.0010	0.0136	0.0031	3	497	500	8	ONS 2013 minus homicide
							_
0.0450	0.0553	0.0026	341	6481	6822	343	Adjusted as necessary using
0.0016	0.0040	0.0006	18	6804	6822	21	South Glos data adjusted fo
0.0001	0.0011	0.0003	3	6819	6822	2	South Glos data adjusted fo
0.0039	0.0074	0.0009	38	6784	6822	48	ONS 2013 plus homicide
							-
0.0450	0.0553	0.0026	341	6481	6822	339	Adjusted as necessary using
0.0086	0.0135	0.0012	75	6747	6822	66	Used ratio identified/referre
0.0040	0.0076	0.0009	39	6783	6822	41	South Glos: Advocate had co
0.0039	0.0074	0.0009	38	6784	6822	37	ONS 2013 plus homicide
0.0707	0.2301	0.0398	10	61	71	12	Taft 2011, adjust for intensi
0.0000	0.0309	0.0077	0	71	71	1	ONS 2013 plus homicide
0.0136	0.1912	0.0444	3	30	32	2	Taft 2011, adjust for intensi
0.0000	0.0438	0.0110	0	32	32	1	ONS 2013 plus homicide
0.840	0.860	0.0050	4310	761	5070	-	Kind 1999 - UK population
0.503	0.749	0.0630	36	21	58	-	Wittenberg 2006 (Table 2 Br
0.518	0.771	0.0650	34	18	53	-	Wittenberg 2006 (table 2 Br
0.503	0.749	0.0630	36	21	58	-	Wittenberg 2006 (Table 2 Br
£0.01	£1.18	£0.32	£1	£0.32			IRIS AE budget / average num
£8	£1,127	£306	£1	£306	-	-	IRIS AE budget + previous IRI
£51	£7,374	£1,999	£1	£1,999	-	-	EIGE report
0.75	1.25	-	-	-	-	-	Assumption, For sensitivity
0.9	11				-		Assumption For sensitivity

IRIS AE budget Assumption

#16+females in 25 partici IRIS main paper IRIS main paper ONS GP practice data

Assumption

			Assumptio	n based on	stea
ov (Control)	Markov (Intervention)	Unit costs	Literature	+	
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## IRIS CEA: User-friendly tool and narrative

### Tool

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AB	С	D	E F	C	3	Н	1
1 Necessary data items for calculations of local (	Cost-Effectiveness Estimate	15					
3							
4 Local prevalence of domestic violence and abuse	pAbuse	6.74 In p	percentage terms				8
6 2 Number of women registered in IRIS practices		100000					
7		100000					
9		100000					
Number of women referred to advocacy for the first time	in the past	90					
1							
Number of women referred to advocate and with whom o	contact was						
made for the first time in the past year for all IRIS implem	nented	70					
3							
Number of women referred to advocacy for the first time	in the past	10					
b year for non-IRIS practices							
Number of women referred to advocate and with whom	contact was	6					
7 made for the first time in the past year for practices with	nout IRIS	6					
.7							
Budget of the IRIS programme in local area (including adv	vocate						
salaries, travel, recruitment, laptop, telephone, publicity,	clinician For the	£50,000.00					8
9 8 past year	For the	ing	oounds (£)				
<ul> <li>Solution of the second s</li></ul>	with	£320.46	oounds (£) <u>If unknown, v</u>	e assume the	IRIS trial estin	nates apply	
2			Estimate from	n trial: £320.46	6 (inflated to 2	019)	
3 Number of practices with IRIS		20					3
5 Number of practices without IRIS		20					
6							
8							
9 Number of women referred to advocate and with whom o	contact was						
1							
32							
33							
5							
Markov Model     Data Items     Data	etailed Results 🔒 Sumn	nary Results +					

#### Narrative

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rt Draw	Design	Layout	References	Mailings	Review	Vi
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#### How to complete the 'data Items" sheet (1)

	Necessary data items for calculations of local	Cost-Eff	ectivene	ess Estimates
			-	
	Local prevalence of domestic violence and abuse	pAbuse	$\langle$	6.74 🔺 In per
	Number of women registered in IRIS practices		$\subset$	73000
	Number of women registered in practices without IRIS		<	70000
	Number of women referred to advocacy for the first time in the past year for IRIS practices			120
	Number of women referred to advocate and with whom contact was made for the first time in the past year for all IRIS implemented practices			80
	Number of women referred to advocacy for the first time in the past year for non-IRIS practices			35
	Number of women referred to advocate and with whom contact was made for the first time in the past year for practices without IRIS			10
	Budget of the IRIS programme in local area (including advocate salaries, travel, recruitment, laptop, telephone, publicity, clinician consultancy, evaluation and central management costs) - For the past year			£50,000.00
	Cost of onward referral based on average of contact time with advocate (per women)			£305.62 in pou
	Number of practices with IRIS		1	24
	Number of practices without IRIS			21
l				

Page 1 of 8 1401 words 🕮 English (United Kingdon

III II - - - + 110%





IRIS

## Data on local prevalence of DVA and women aged 16 or over registered in **Manchester GP practices**

### Local prevalence of DVA – sources

- Police data on recorded crime and DVA incidents
- Community Safety Partnership
- GP waiting room studies •
- Used Crime Survey England and Wales IRISi

### (which excluded respondents older than 59 until 2017).

### No. of women aged over 16 registered in GP practices

- NB Template based on women, exclude men
- Data from NHS Digital, or
- NHS CCG Primary Care

NB Heat Maps showing local DVA prevalence are powerful training tool





## Referral for advocacy and no contact rates

Number of women referred to IRIS AE (advocacy) for the first time in the past year for IRIS practices

These are practices that were IRIS trained before start of 12 months CEA study period New referrals to IRIS only **Exclude men Exclude re-referrals from GP practice or self-rereferred** Exclude those in continuing service at start of study year

Number of women referred to advocate and with whom contact was made for the first time in the past year for all IRIS implemented practices 'No contact' rates varied annually

Number of women referred to advocacy for the first time in the past year for non-IRIS practices If all practices are IRIS trained, use referral numbers from practices BEFORE IRIS launched

Number of women referred to advocate and with whom contact was made for the first time in the past year for practices without IRIS





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## Budget, cost of onward referral, no GP practices

#### **Budget of the IRIS programme in local area**

- For the study year, 12 months
- Use total budget •

### Cost of onward referral based on average of contact time with advocate (per women)

- We had a problem with this •
- Use IRISi trial data

#### No Practices with and without IRIS

- **GP** practices amalgamated over the years •
- In 2017 used 45 GP practices IRIS trained and 45 not IRIS trained at start of year •
- If all practices are IRIS trained use number of IRIS-trained GP practices at start of study year and compare to number of GP practices before IRIS was launched.





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## **MWA IRIS CEA results 2020**

MWA IRIS is cost neutral for the NHS, less than 10p per woman aged 16 or over per year, and saves over £40 per woman per year when combined with societal savings.





## **Explaining CEA to colleagues**

### **Decision Rule (based on NICE recommendation)**

### Lower costs and better outcomes = **Dominant strategy**







Universitv

# **Decision Rule (based on** NICE recommendation)







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## **Decision Rule**



(-) Difference in effects (+)

NIHR CLAHRC NORTH THAMES © UCL

Does the health benefit justify the extra costs?

### **Effects**

It depends on how much the health-care system is willing and able to pay for additional health benefits

 it needs a threshold of what is acceptable





## **Decision Rule**

NICE National Institute for Health and Care Excellence

Costs

#### Cost/QALY<£20,000 per capita: likely to be accepted

Cost/QALY £30,000 per capita: needs additional factors to justify

Cost/QALY>£30,000 per capita: these factors have to be increasingly strong

£1,000,000/QALY \$100/QALY gained







# Patient population data

NHS Digital dashboard link: <u>https://digital.nhs.uk/data-and-</u> information/publications/statistical/patients-registered-at-a-gp-practice

- You can filter by
  - Region
  - STP
  - -CCG
  - Practice
- You can view the data using the dashboard, or download the CSV file
- Data includes patient gender so you can filter to only include females
- One of the CSV file options has data disaggregated by age of patient (years) so you can exclude those below 16
- You can filter for the relevant practices in your area using either the postcode or the practice code

