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Screening stratificato per rischio

- Stessa storia naturale della malattia (progressione , velocità di crescita)

  a) rischio elevato: lo screening è più efficiente (VPP più elevato)

Intervalli più ravvicinati di screening riducono i casi intervallo, aumentano sovradiagnosi e falsi positivi.

  b) rischio più basso: screening meno efficiente (VPP basso).

 Intervalli più lunghi aumentano il valore predittivo, i casi intervallo, diminuiscono sovradiagnosi falsi positivi

Assumptions

- RR 1: Period Preval=0.055
- RR 3: Period Preval=0.0183

- In 8 years 9 yearly tests or 5 biennial tests

- Sensitivity 80% - 90%
- Specificity 1°liv =95% - 98%
- Specificity 2°liv=98%

- Overdiagnosis 5%
- Interval cancers (proportional incidence)
  - 1° anno: 25%
  - 2° anno: 50%

Ten years outcome according to RR and screening interval: se 80%, sp 95% 1° level , 98% 2° level per 100,000 persons; 10% RR3

	Annuale		Biennale	
	RR 1	RR 3	RR 1	RR 3
Interval cases	458	137	825	207
FN (FNe+FNa)	181	53	296	72
FN Total	638	190	1121	279
FP overdiagnosis	76,5	22	73	17
FP error	892	87	496	48
FP total	968	110	568	66
TP	1454	428	1380	336

Polygenic susceptibility to prostate and breast cancer: implications for personalised screening

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BACKGROUND: We modelled the efficiency of a personalised approach to screening for prostate and breast cancer based on age and polygenic risk-profile compared with the standard approach based on age alone.

METHODS: We compared the number of cases potentially detectable by screening in a population undergoing personalised screening with a population undergoing screening based on age alone. Polygenic disease risk was assumed to have a log-normal relative risk distribution predicted for the currently known prostate or breast cancer susceptibility variants ($N = 31$ and $N = 18$, respectively).

RESULTS: Compared with screening men based on age alone (aged 55–79: 10-year absolute risk $\geqslant 2\%$), personalised screening of men age 45–79 at the same risk threshold would result in 16% fewer men being eligible for screening at a cost of 3% fewer screen-detectable cases, but with added benefit of detecting additional cases in younger men at high risk. Similarly, compared with screening women based on age alone (aged 47–79: 10-year absolute risk $\geqslant 2.5\%$), personalised screening of women age 35–79 at the same risk threshold would result in 24% fewer women being eligible for screening at a cost of 14% fewer screen-detectable cases.

CONCLUSION: Personalised screening approach could improve the efficiency of screening programmes. This has potential implications on informing public health policy on cancer screening.

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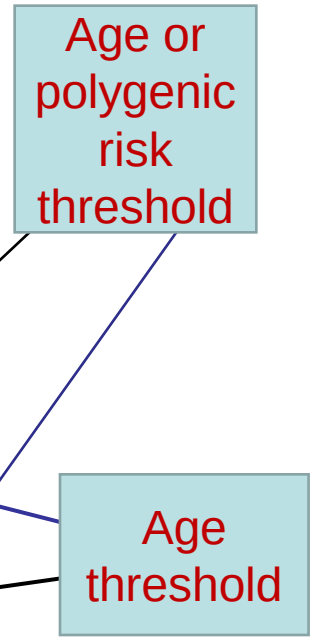
Table 3 Reclassification of population of 100 00 women 35–79 years eligible for screening and in whom breast cancer could be detectable, under age-based or personalised screening strategies.

Personalised screening	Age-based screening		
Polygenic risk threshold	**<47 years**	**⩾47 years**	**Total**
Population			
<2.5%	30 276	19 926	50 202
⩾2.5%	4429	45 368	49 798
Total	34 705	65 295	100 000
Cases			
<2.5%	26	38	64
⩾2.5%	9	162	172
Total	35	200	236

Eligibility based on age 47 or polygenic risk equivalent to 10-year absolute risk for age 47 (2.5% 10-year absolute risk); England 2002–2006.



Personalized screening for women 35-79 yrs at 2.5% in 10yrs risk threshold would result in 24% fewer women eligible for screening and 14% fewer detectable cases compared with screening women based on age 47- 79 alone

Equità

- Equità : stessa probabilità che un una neoplasia avanzata del CCR sia diagnosticata in funzione del livello di rischio.

Razionamento per garantire equità di accesso

Effetto dell'allungamento degli intervalli sulla copertura

tra due inviti allo screening

Copertura	Intervallo anni			
	2	3	4	5
0,1	0,1	0,15	0,2	0,25
0,2	0,2	0,3	0,4	0,5
0,3	0,3	0,45	0,6	0,75
0,4	0,4	0,6	0,8	1
0,5	0,5	0,75	1	
0,6	0,6	0,9		
0,7	0,7	1,05		
0,8	0,8			

Lesioni aggressive, a rapida crescita

Test più ravvicinati e/o in diversi, specifici gruppi di età

Come riconoscere gli individui suscettibili (predisposti ad avere un cancro a rapida crescita) ?

Concentrazioni di hb? MiRNA, SNPs? Stili di vita? Familiarità?

Solo aumento del rischio?

SCREENING STRATIFICATO PER RISCHIO DI AAD (prevenzione), CA INVASIVO (riduzione mortalità), e/o verso AAD e CA a progressione rapida (diversa storia naturale)?