

The impact of early detection of colorectal cancer on lifetime medical costs

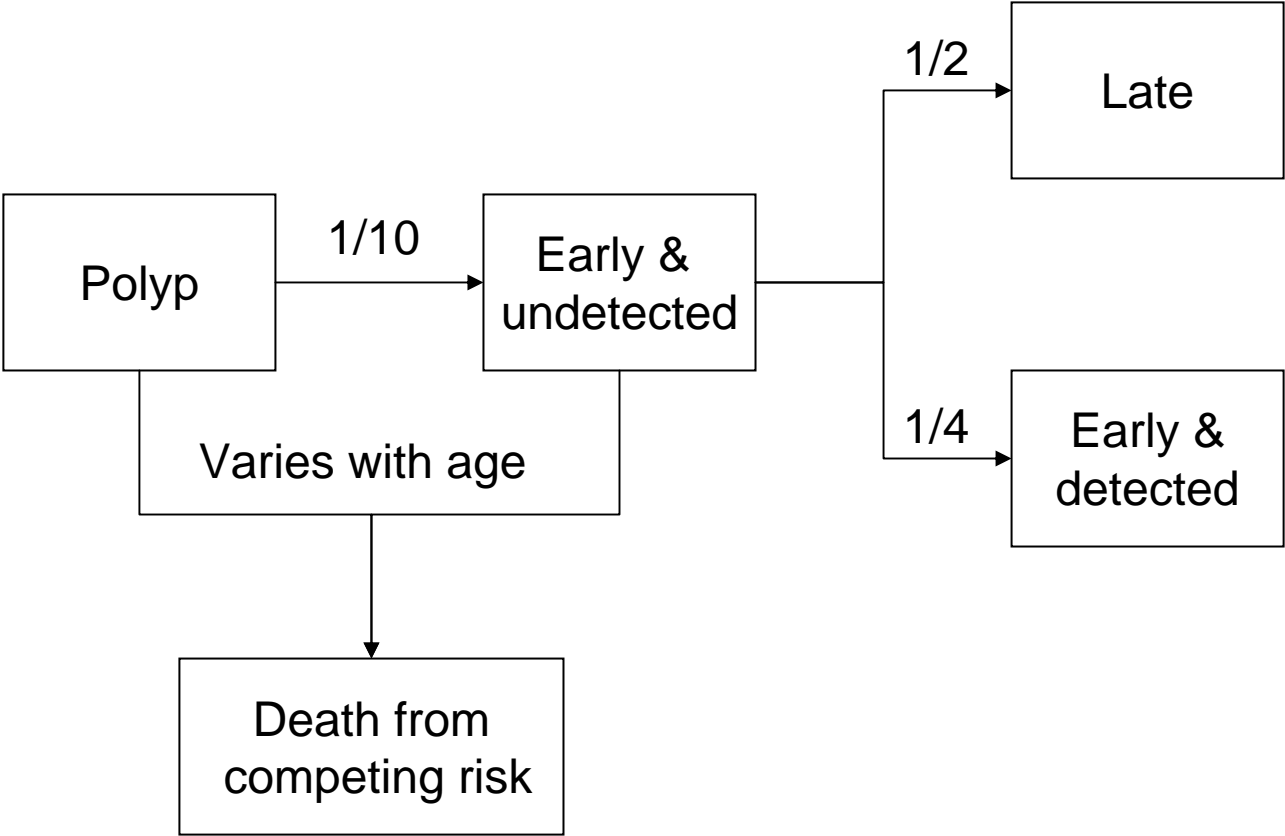
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Estimating savings from early detection is difficult

- Not all patients with detected early stage disease would have developed late stage disease if untreated
- Prolonging life is associated with higher costs for comorbid illnesses
- The high cost of late stage disease is often just the high cost of end of life care, but everyone dies.

Natural history model



Costs of detected disease

$$EC_t = I + \sum_{j=t}^T S_j [(1 - d_j) \times O + d_j D]$$

Where

I = initial costs

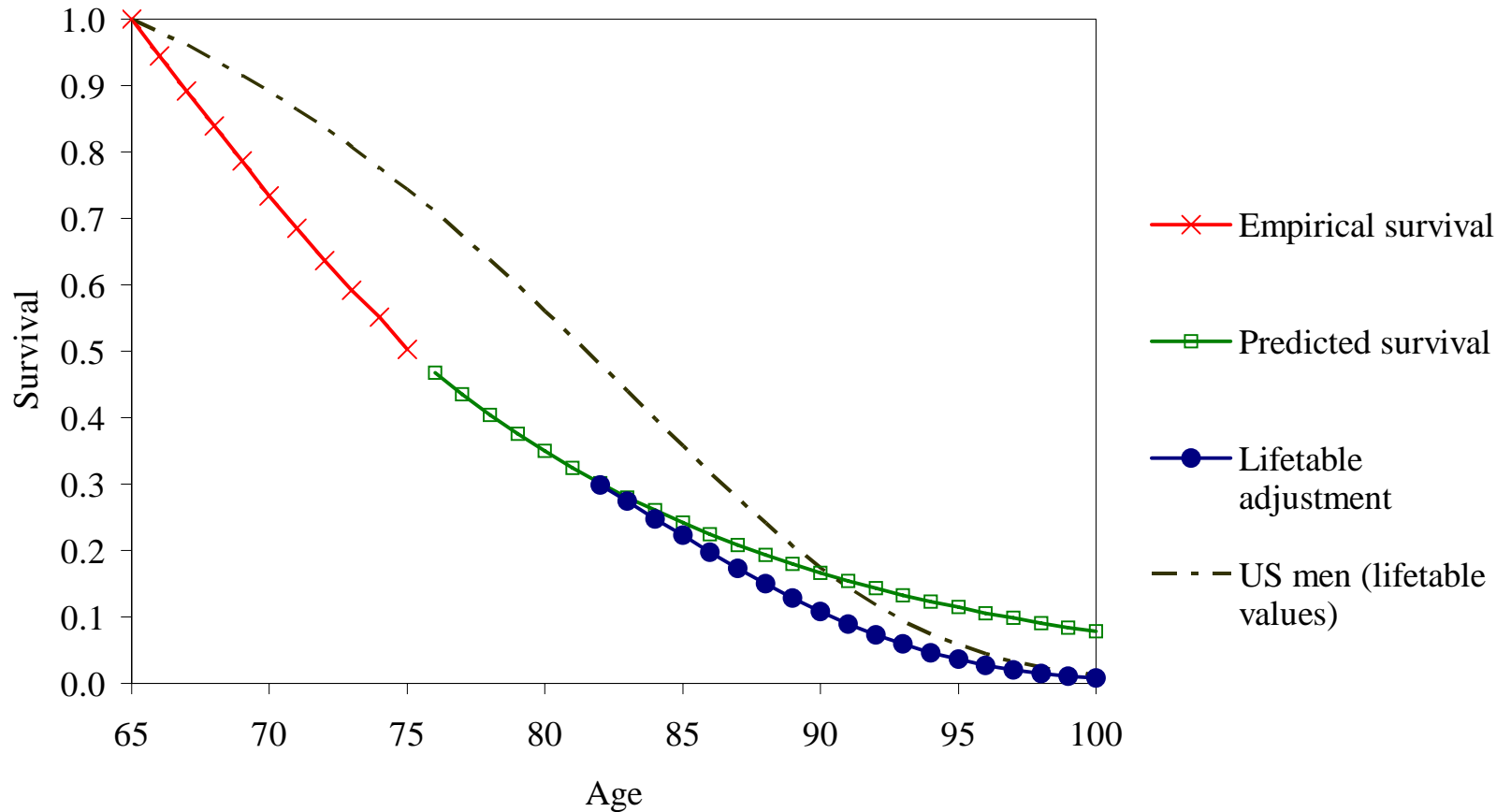
S = survival probability

d = mortality rate at time j

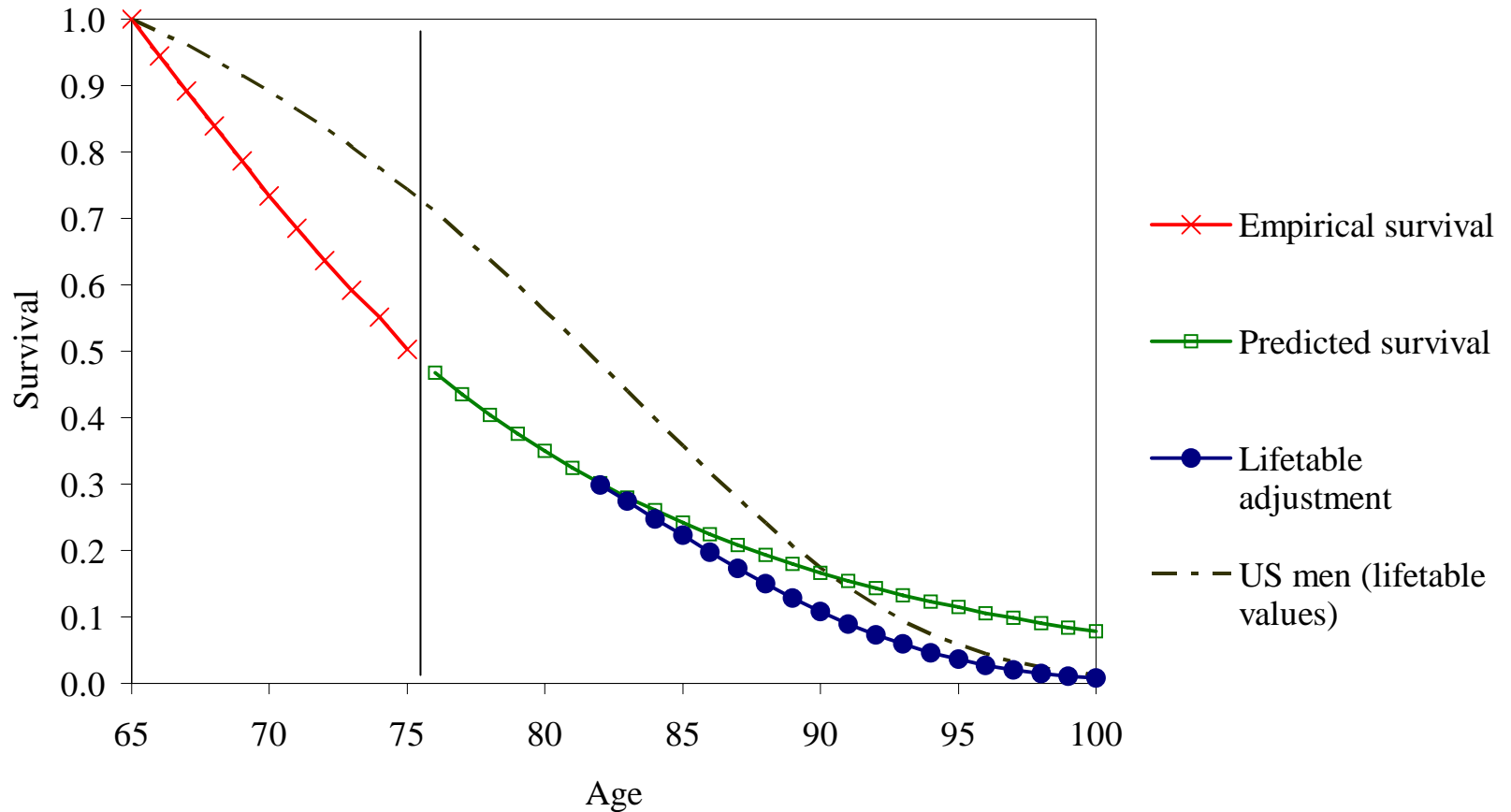
O = ongoing cost

D = costs in last year of life

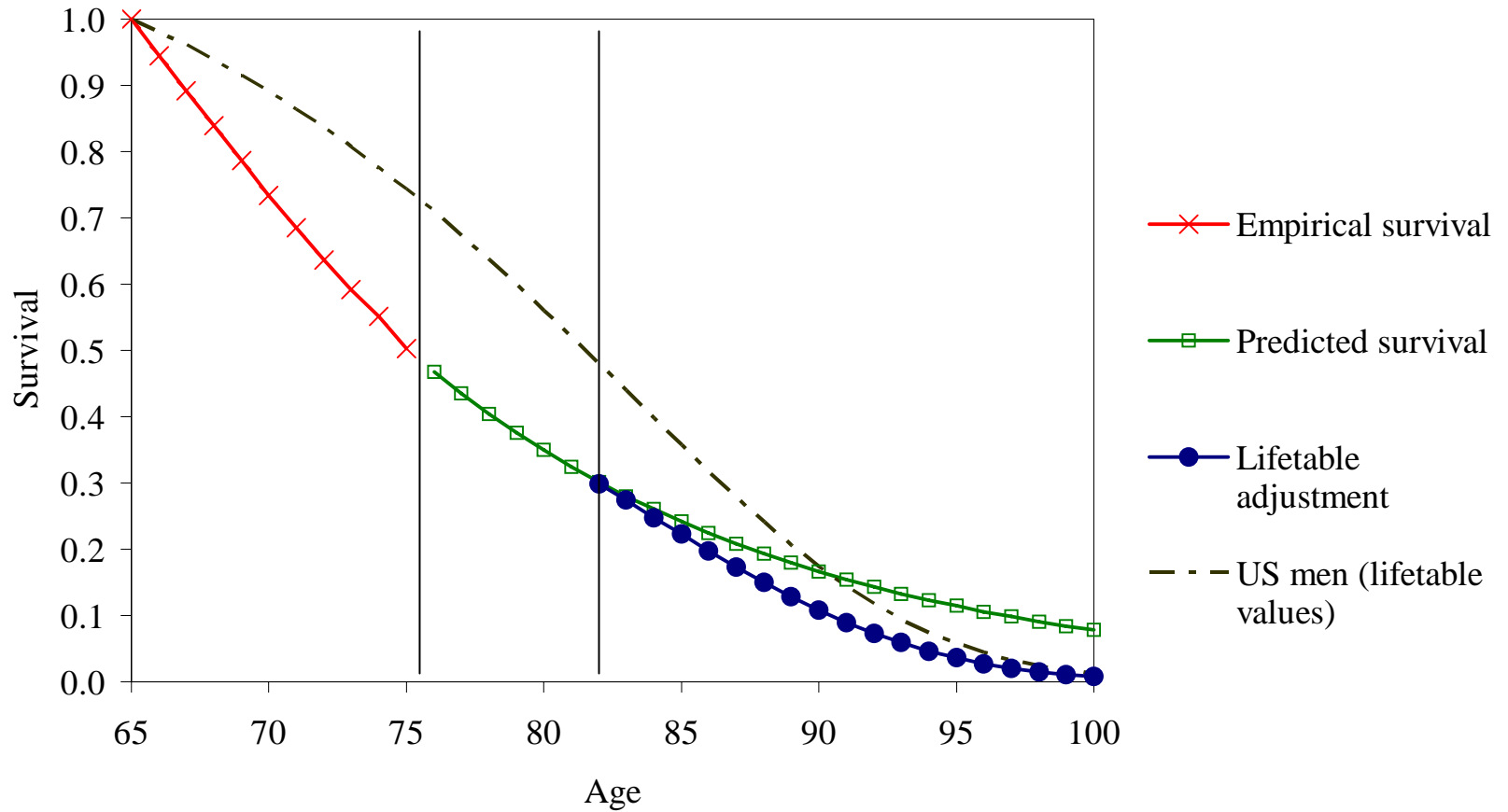
Estimating survival time for a 65-year old man with early-stage cancer and no comorbidities



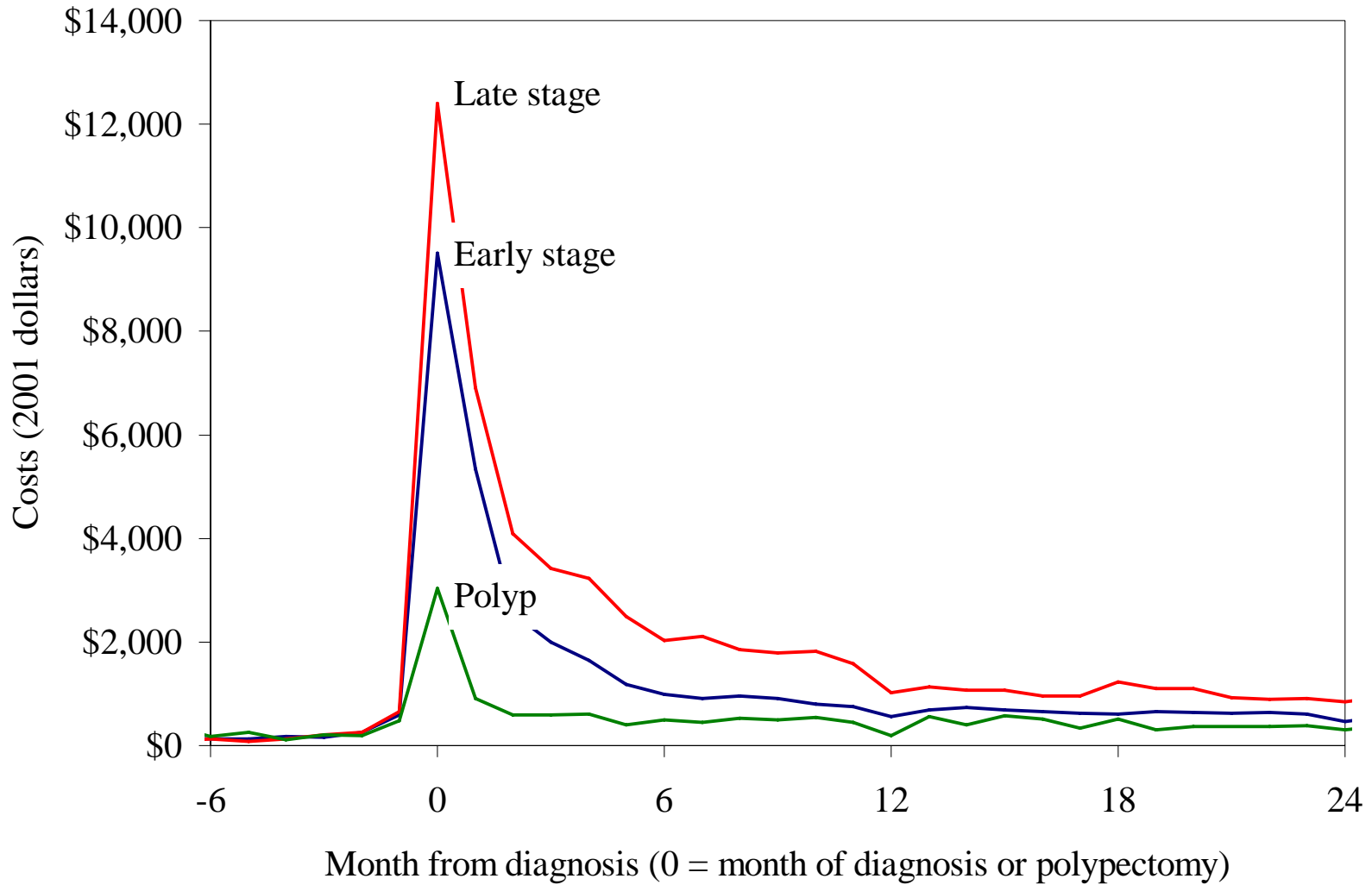
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Average monthly costs by stage at diagnosis for men 65-74 without comorbidities



Costs by stage at diagnosis, no comorbidities

	Men			Women		
	Polyp	Early	Late	Polyp	Early	Late
First year	9,485	27,403	42,350	8,644	28,039	43,525
Last year	29,881	25,856	28,585	31,369	29,669	32,516
Ongoing	3,974	5,174	6,165	3,180	4,259	5,416

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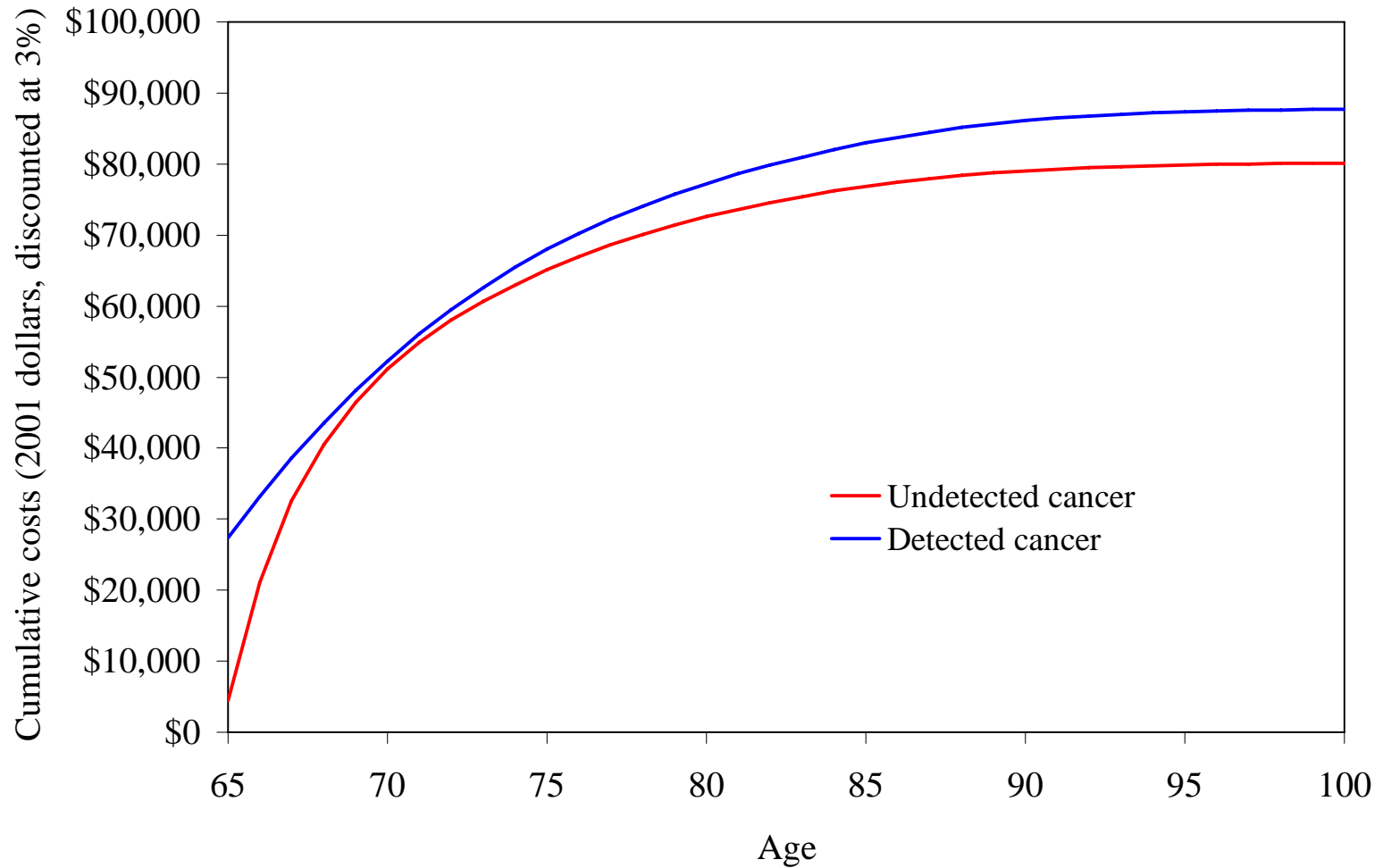
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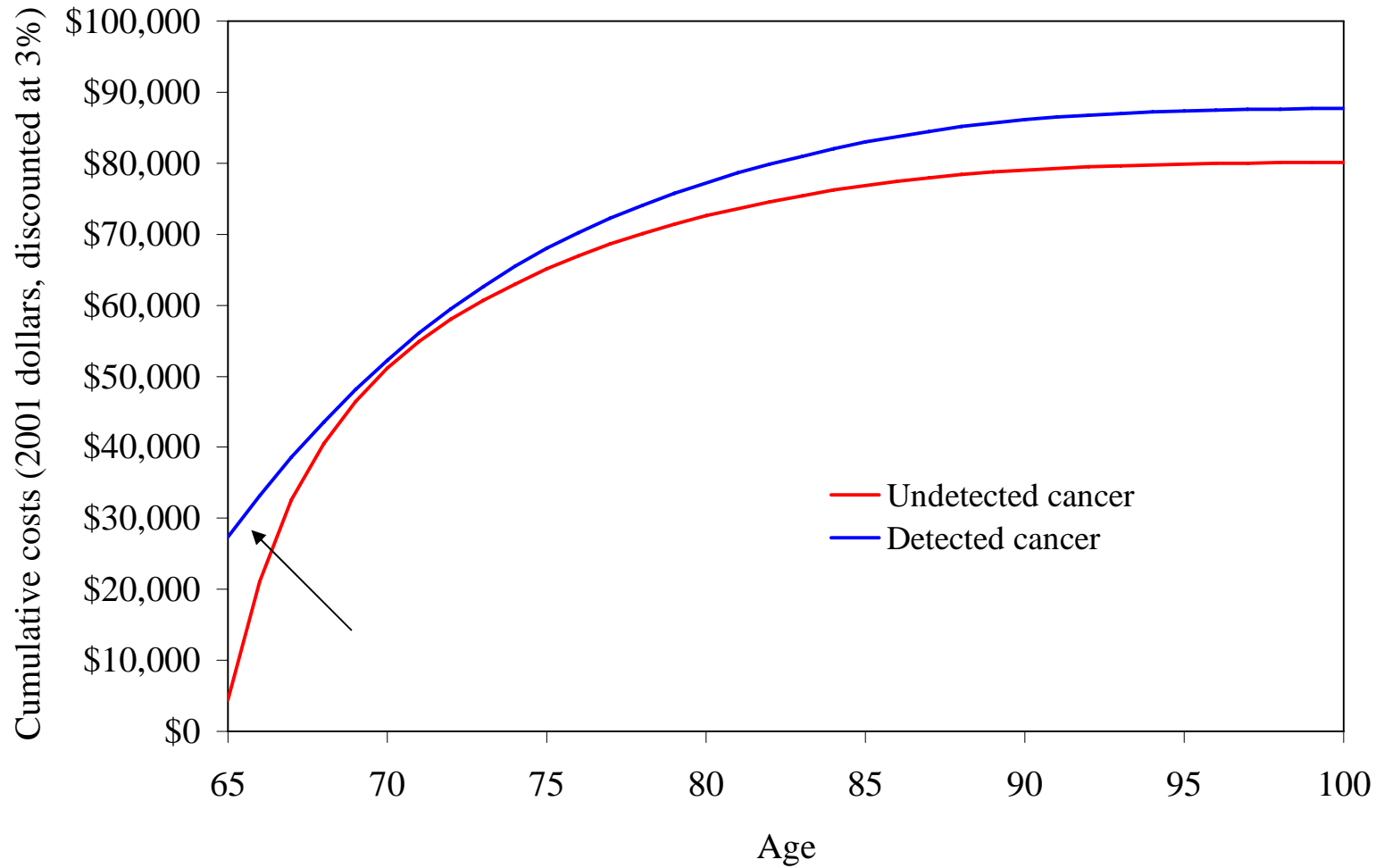
Lifetime medical costs of patients with detected v. undetected polyps, no comorbidities

Comorbidity	Men			Women		
	65	75	85	65	75	85
Screen-detected	69,599	59,627	45,135	64,808	61,821	45,720
Undetected	77,259	60,155	40,391	75,690	64,394	43,482
Difference	(7,660)	(528)	4,745	(10,883)	(2,572)	2,238

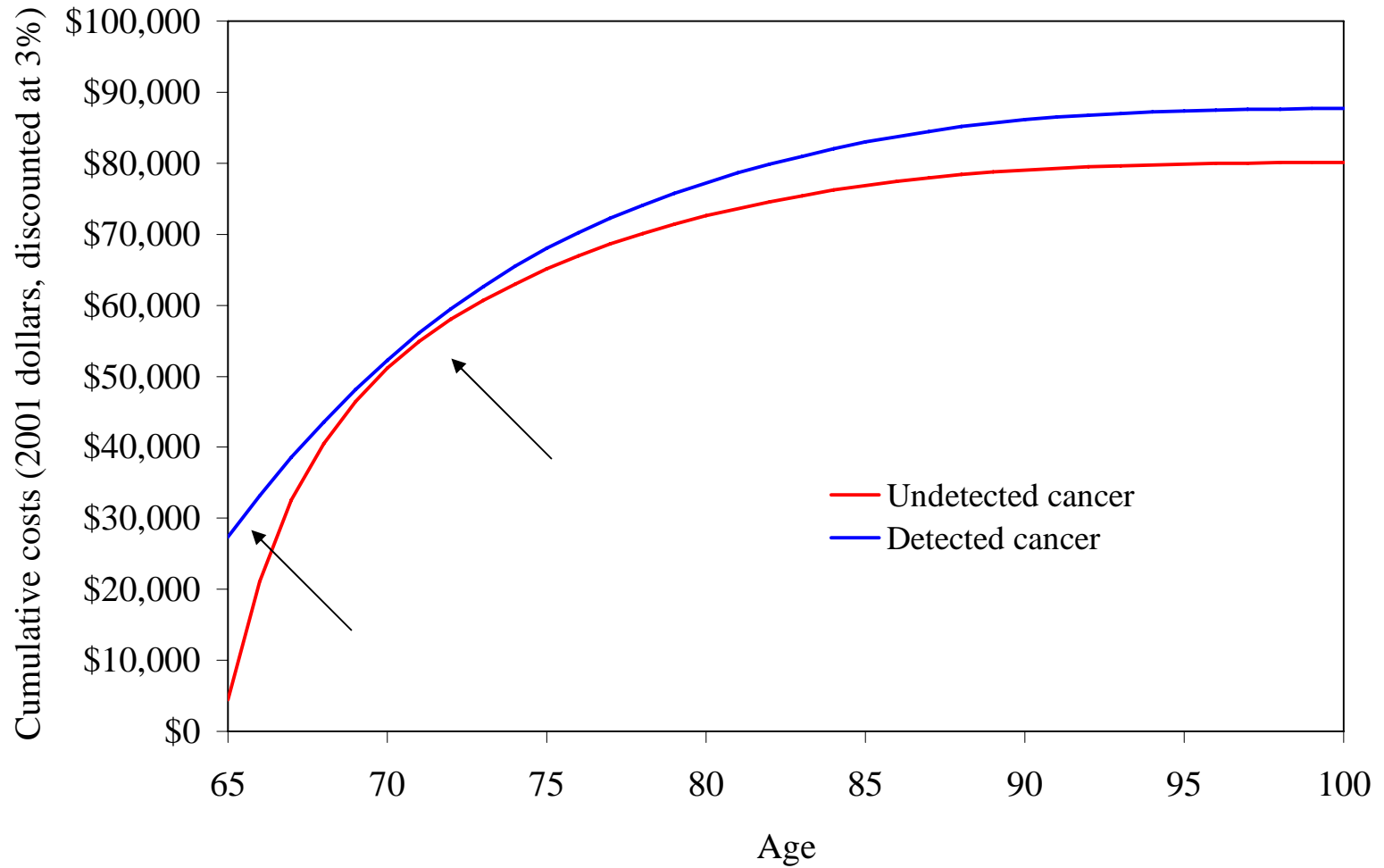
Cumulative lifetime costs for 65-year old men with early stage cancer and without comorbidities



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