

Direct and indirect costs of inflammatory bowel disease: ten years of follow-up in a Danish population-based inception cohort

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Conflict of interest

- Travel:
- Janssen-Cilag A/S – Immunology across borders

Previous reports on direct and indirect costs

- IBD patients are expensive
- However –
 - Very different definitions of the socio-economical variables
 - Huge national differences in the available help and possibilities
 - **Self-reported**

Methods

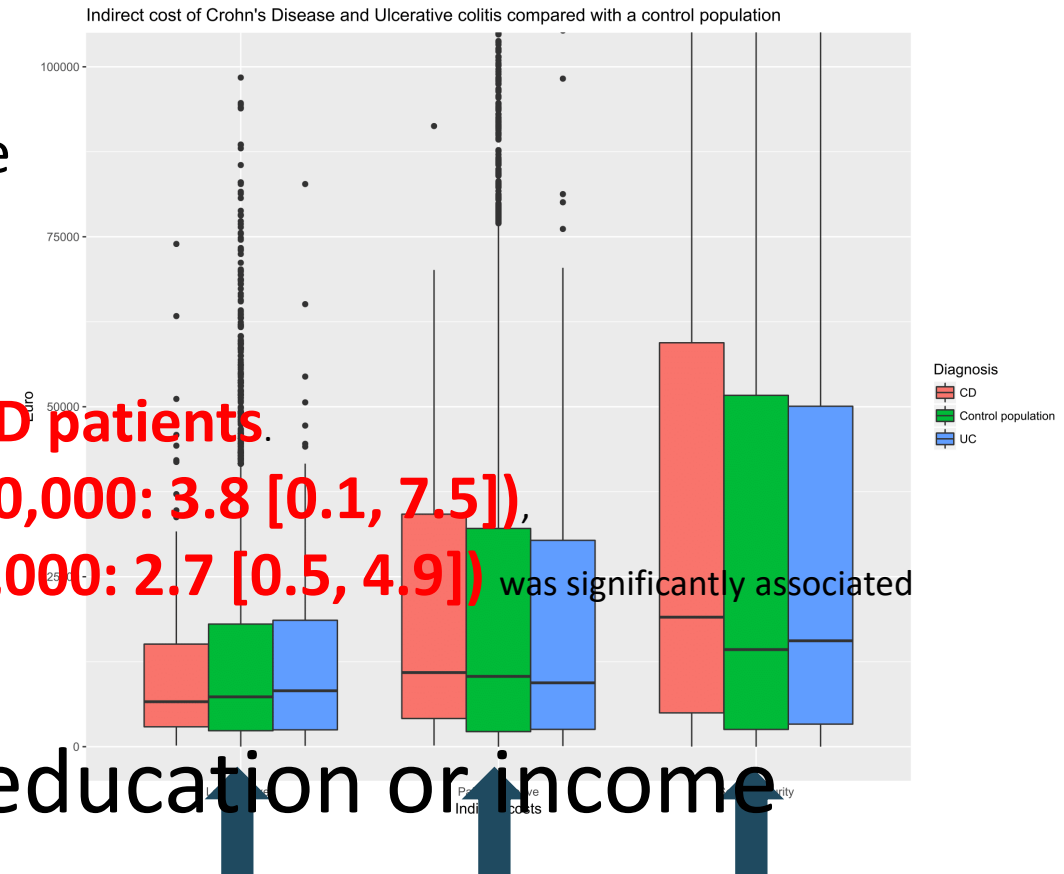
- Vind et al.
 - Well-defined area with 1.2 mil citizens
 - Between 2003-2004
 - n = 513 (213 CD, 300 UC)
- Vester-Andersen et al. 2011
 - Re-evaluated and validated all patients diagnosis, phenotype and disease course
- Statistic Denmark. e.g.
 - National patient registry
 - National prescription registry
 - All paid out sick-leave benefits
 - All paid out social security
 - Number of days of unemployment
- All patients was matched 1:20
 - By gender, age, municipality

The direct costs

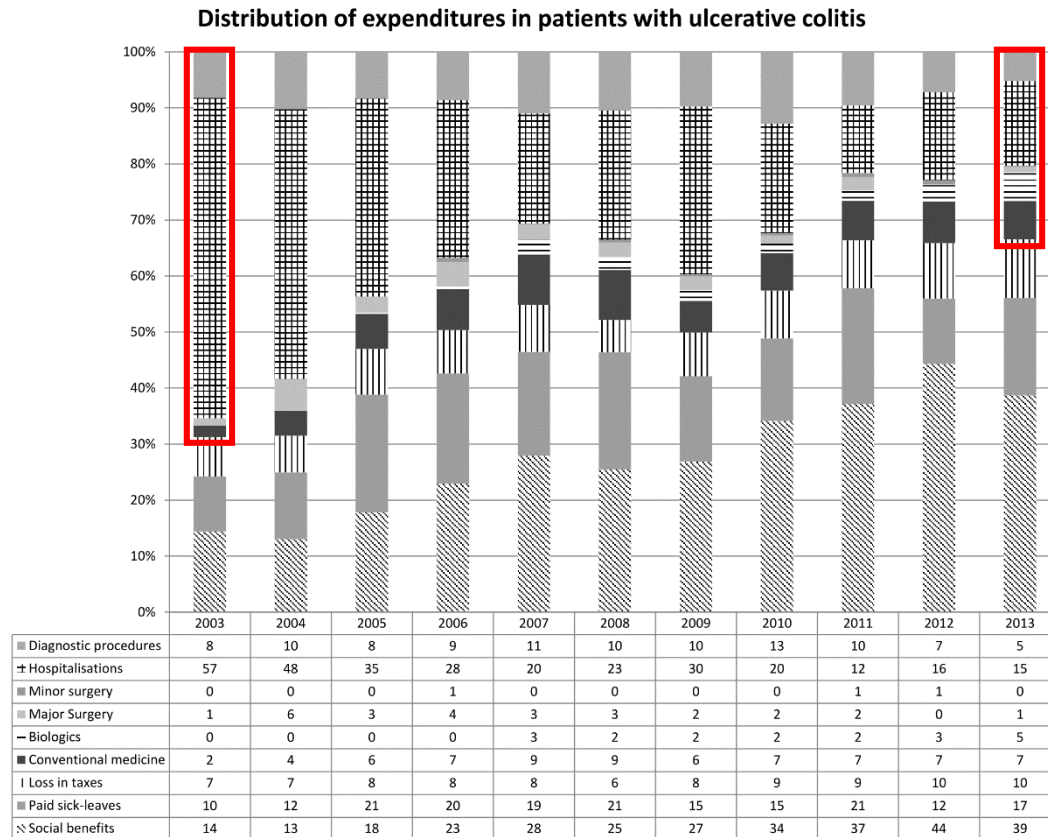
- Direct cost:
 - CD patients were significant more expensive then UC patients
 - (CD: 42.300 [24.500-74.100] vs UC: 29.600 [17.200-46.900], $p < 0.001$)
 - Except for **diagnostic procedures** and **5-ASA** treatment
- Associated factors:
 - **No factors** were found **concerning CD patients**.
 - **Left-sided colitis (estimate of €10,000: 0.9 [0.1, 1.7])**
 - **Extensive colitis (estimate of €10,000: 1.3 [0.4, 2.2]) at diagnosis** were significantly associated with **higher direct costs**

The indirect costs

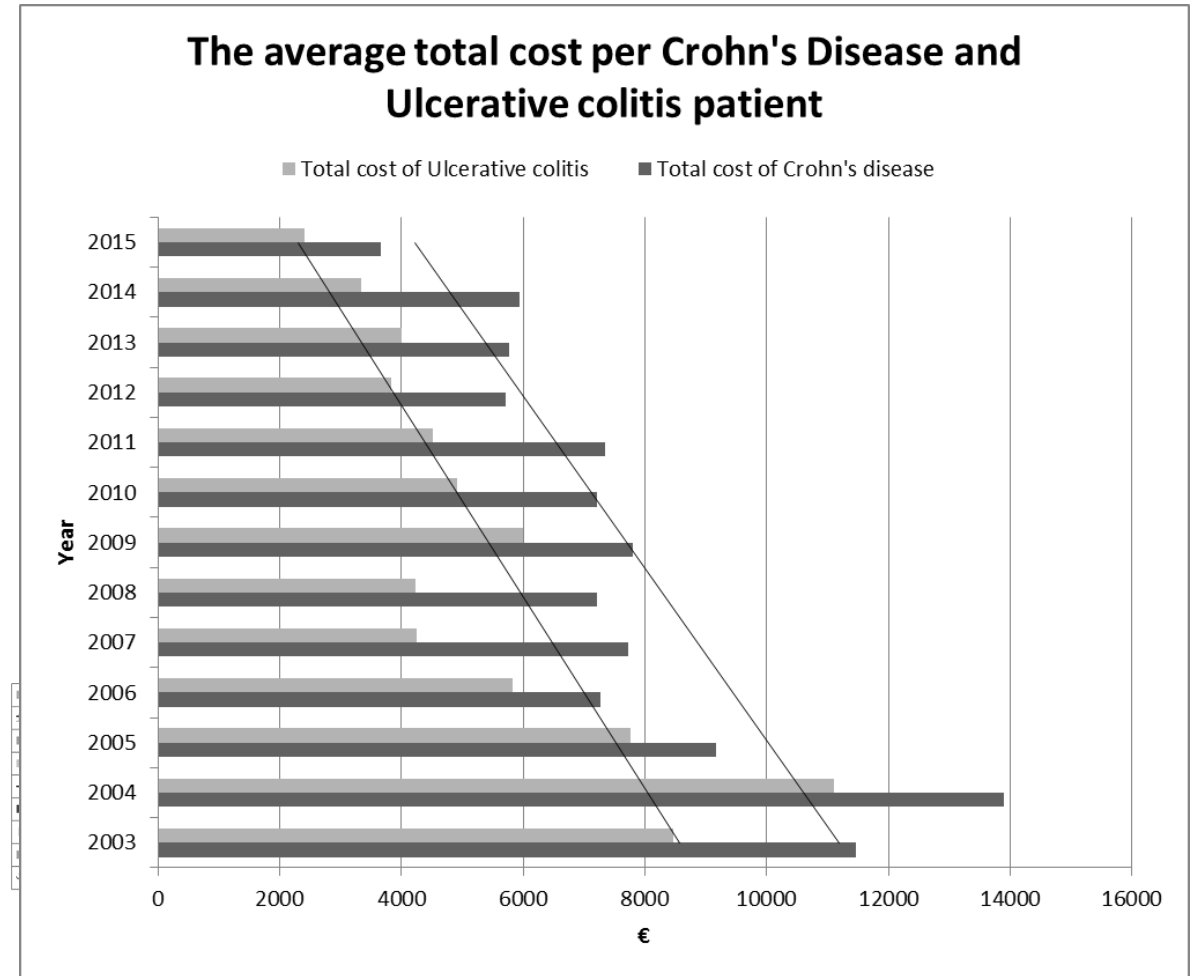
- The indirect costs:
 - No significant differences between the IBD and control population
- Associated factors:
 - **No factors** were associated with the indirect costs **in CD patients**.
 - **Being 17-40 years old (estimate of €10,000: 3.8 [0.1, 7.5])**,
 - **Smoker at diagnosis (estimate of €10,000: 2.7 [0.5, 4.9])** was significantly associated with **greater indirect costs**.
- No significant difference in education or income



Total costs



costs:



In conclusion...

- The direct cost remained high but within previous reported ranges.
- Indirect cost of IBD patients did not differ from the general population
- The total costs were mainly driven by hospitalisation, but over time the indirect costs accounted for a greater share of the figure
- Modern treatment regimens and the Danish flexicurity model are supporting IBD patients in their ability to perform and carry out an education or job, as no significant differences were found compared to the control population.



Thank you for your time



B) Direct costs																
Median (IQR) €	Diagnostic procedures		Major and minor surgeries		Hospitalisation		5-aminosalicylates		Systemic steroid		Immuno-suppressants		Biologics		Total direct costs	
	Median cost	Per year of follow-up	Median cost	Per year of follow-up	Median cost	Per year of follow-up	Median cost	Per year of follow-up	Median cost	Per year of follow-up	Median cost	Per year of follow-up	Median cost	Per year of follow-up	Median cost	Per year of follow-up
Total amount in millions	3.4		1.8		13.9		1.6		0.05		0.2		1.9		22.8	
Crohn's disease	5,3	600	0***	0***	27,000***	3,100***	900***	89***	77**	8**	166***	20***	0***	0***	42,300***	4,900***
	(2,700-11,000)	(300-1,100)	(0-11,000)	(0-1,200)	(16,000-45,000)	(1,00-5,500)	(200-2,300)	(18-240)	(16-148)	(2-18)	(0-955)	(0-100)	(0-2,071)	(0-210)	(24,500-74,100)	(2,900-8,100)
Ulcerative colitis	4,8	600	0***	0***	17,000***	2,000***	3,100** *	394***	40**	4**	0***	0***	0***	0***	29,600***	3,400***
	(2,400-8,500)	(300-1,000)	(0-0)	(0-0)	(8,400-29,000)	(1,100-3,400)	(1,000-6,800)	(119-758)	(0-131)	(0-13)	(0-42)	(0-7)	(0-0)	(0-0)	(17,200-46,900)	(1,900-5,100)

** p = 0.001, *** p < 0.001

Months	Crohn's disease	Ulcerative colitis	p-value	Control population	p-value
Paid sick-leave	8.4 (2.6-19.8)	5.1 (1.6-15.9)	0.2	5.7 (1.2-16.4)	0.09
Leave of absence	12.7 (3.6-36.9)	8.4 (2.6-28.1)	0.15	8.9 (1.9-33.2)	0.1
Unemployment	5.3 (2.3-12)	6.6 (2-14.8)	0.6	5.9 (1.9-14.4)	0.7

A) Indirect costs						
Median (IQR) €	Paid sick leave		Social Security		Loss of income tax	
	Median cost	Per year of follow-up	Median cost	Per year of follow-up	Median cost	Per year of follow-up
Total amount in millions	6.2		11.1		2.4	
Crohn's disease	10,300	1,100	17,900	1,900	6,200	700
	(3,900-32,100)	(400-3,400)	(4,700-55,800)	(500-5,800)	(2,800-14,200)	(300-1,200)
Ulcerative colitis	8,800	1,100	14,600	1,500	7,700	8,00
	(2,400-28,500)	300-2,800)	(3,100-47,100)	(400-5,000)	(2,300-17,500)	(200-2,200)
Controls	9,700		13,400		7,000	
	(2,100-30,200)		(2,400-48,600)		(2,500-16,400)	

Strength and limitations

- Use of national registries
- Populations-based cohort
- Missing out-patient visits
- Size of the cohort
- Non-transferable to other countries
 - However...
 - Work-related and financial/educational support (known as flexicurity model in Denmark) are able to support IBD
 - Hopefully encourage politicians to make similar conditions available for IBD patients.