

Temporal changes in the epidemiology, treatment and outcome of inflammatory bowel disease in South Limburg

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VALORIZATION



Valorization

Valorization is officially defined as “the process of value creation out of knowledge by making this knowledge suitable and available for economic and societal utilization and to translate this into high-potential products, services, processes and industrial activity”.

In this chapter, the implications of our findings on the relevant socioeconomic domains of ‘health care and society’ and ‘patients and professionals’ are discussed.

Implications for healthcare and society

Chronic diseases strain the healthcare system because these can only be managed, not cured. Patients are often diagnosed at young age, resulting in a longstanding use of healthcare resources and high costs. Inflammatory bowel disease [IBD] is most often diagnosed in young adulthood [20-40 years of age] and most patients require follow-up in the outpatients’ clinic. During disease course, many require expensive medical treatment and at some point in-hospital medical or surgery therapy¹⁻⁶, resulting in additional healthcare costs.⁷ Based on clinical data from IBD patients diagnosed between 1970 and 1993, Silverstein *et al.* estimated the life-time direct costs of Crohn’s disease [CD] to be \$ 39,906. Major cost driver at that time was intestinal surgery, accounting for 44% of the total costs.⁷ More recently, Van der Valk *et al.* estimated the annual costs of CD in the Netherlands at € 7,835 per year.⁸ Apart from these direct costs, indirect costs are also noteworthy in IBD. The chronicity of the disease and its unpredictable, fluctuating course can have major impact on work, leisure time and participation in society. For instance, absenteeism and reduced work productivity are often present in IBD patients. Valid estimates of the total indirect costs of IBD are difficult to obtain, but European studies presented estimates between \$ 5,128 – \$ 14,136 per year.⁹ Several findings discussed in the present thesis indicated that the costs of IBD are higher than previously expected and will further increase in the near future.

First, in *Chapter 3*, we showed that the incidence of IBD is also increasing in the Netherlands, with annual increases of 6% [CD] and 4% [UC] between 1991 and 2010. Data from the most-recent years of the study period even showed higher rates. The IBD incidence in South Limburg is among the highest reported in literature¹⁰, illustrating a high disease burden in the Netherlands. Based on the South Limburg data, an estimation of the nationwide IBD prevalence was made, illustrating that 80,627 patients suffer from IBD [2010], which is much higher than previously assumed [55,000]. The ongoing rise in IBD incidence warrants further research on its etiology, in order to come to preventive measures. As discussed in *Chapter 10*, environmental factors are interesting targets, since they are modifiable and previous research have found associations between the onset of IBD and diet, smoking, urbanization and air pollution.¹¹ However, the interaction between host and environment is

complex and relations are preferably studied using system biology modeling, incorporating factors as from early life [exposome approach].

Second, in *Chapters 5* and *6*, we showed that the medical management of IBD has changed towards an earlier and more frequent use of immunomodulators and anti-TNF α agents. In particular, anti-TNF α therapy is expensive [estimated at € 10,000 - € 15,000 per patient per year]. A Dutch multicenter study illustrated that current IBD healthcare costs are mainly driven by medical therapy [71% for CD, 59% for UC], rather than by hospitalizations and surgery [20% for CD, 25% for UC].¹² Because recent guidelines advocate an earlier and more frequent use of biologicals¹³ and new treatment strategies also propose a more frequent use of biologicals [*Chapter 10*], rising medication costs can be expected. Part of the expected rise will be tempered by the availability of so-called 'biosimilars', generic formulations of biological agents. Nevertheless, rising medication costs will inevitably lead to rising total healthcare costs, unless medical therapy results in an improved disease outcome. In that case, costs of frequent hospital visits, hospital admissions and surgery may attenuate. In this thesis, however, we found no significant association between the improved disease outcome and the use of immunomodulator anti-TNF α therapy. In literature, anti-TNF α therapy was already found to be cost-effective though, both as monotherapy^{14,15} and combination therapy¹⁶, although efficacy data mainly derive from registration trials, rather than from real-world practice. Moreover, data on cost-effectiveness on the long-term is lacking. Future studies should therefore focus on the long-term cost-effectiveness of biological therapy and future trials on new treatment strategies should include cost-utility analyses.

Third, current and future treatment strategies are aimed at 'tight control', which encompasses regular blood and stool tests, scheduled visits at the outpatient clinic and a low-threshold use of endoscopic or radiologic modalities to assess mucosal inflammation. Such strategies can be expensive, unless they prove their selves to be cost effective in terms of better disease control and, consequent, avoidance of healthcare costs [outpatient visits, hospital admission, surgery].

Altogether, the findings reported in this thesis indicate that IBD is putting more pressure on our healthcare system than previously thought and a further increase in direct health care costs can be expected. It is of interest whether the interventions studied in this thesis result in less absenteeism and can thereby lower the indirect costs. These conclusions demand for action in order to maintain affordable, high-quality IBD care. Next to the aforementioned suggestions for further research, it is important to think of restructuring IBD care to maintain safe, high-quality care, while reducing healthcare costs. Over the past years, there has been an increasing interest in the use of eHealth tools in chronic diseases, such as congestive heart failure¹⁷ and COPD¹⁸. For IBD, the telemedicine tool 'mijnIBDcoach' is available, which follows IBD patients via monthly monitoring modules on tablet or smartphone.

Its use was studied in a large randomized controlled trial, which showed that patients using mijnIBDcoach required less outpatient visits and hospital admissions, while patient satisfaction, risk of flares and the number of courses of corticosteroids were not different from the control group.¹⁹ Thus, telemedicine is a promising and safe management tool with the potential of being cost-effective.

Implications for professionals and patients

Both patients and professionals benefit from having up-to-date information on the IBD incidence and its course.

First, the increasing high pressure of IBD on healthcare and its observed high prevalence in the Netherlands warrants the need for more funding for scientific research. Second, by illustrating that IBD is an increasingly common disease, the present thesis also supports initiatives for improving knowledge about IBD in the general population. Better knowledge may limit patient delay in the diagnostic process and may help reducing the stigma of a disease characterized by frequent bowel movements and urgency. Third, information on the actual disease course helps physicians to educate patients better on their chronic disease, thereby improving patient empowerment. Patient empowerment and engagement in disease monitoring may subsequently lead to better treatment response, patient satisfaction and a more efficient utilization of healthcare resources.²⁰ Information on the [long-term] disease outcome also contributes to shared decision making, for example in a discussion on the need for another medical therapy or surgery. Next to education, insight in the real-world effectiveness of current treatment strategies contributes to the development of better disease management. Real-world treatment effectiveness data can help in the process of clinical decision making in situations in which data from randomized controlled trials are lacking, which is the case in the management of specific populations [*e.g.* elderly] and in therapy selection [*e.g.* the choice of one anti-TNF α agent over another]. Reflecting on the latter, we observed a similar real-world effectiveness of infliximab and adalimumab in CD [*Chapter 9*], which emphasizes that the choice between these two agents can be made based on individual preferences of the physician or patient. In the near future, comparative effectiveness analyses in large real-world cohorts may also help in the upcoming challenge which biological therapy is best for a specific patient [personalized treatment]. Hereby, the time spent on suboptimal therapy may be minimized, which will hopefully lead to a better disease outcome and quality of life on both the short and long term.

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