ECONOMIST IMPACT

Inflammatory Bowel Disease

Addressing the "hidden" disease with innovative, multidisciplinary and patient-centric care

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Contents

About this report

Inflammatory Bowel Disease – Addressing the "hidden" disease with innovative, multidisciplinary, and patient-centric care is an Economist Impact white paper, supported by AbbVie. The report provides an independent analysis of the growing global burden and unmet needs of Inflammatory Bowel Disease (IBD). It draws attention to the evolving burden, shines a light on the direct and indirect costs associated with IBD, maps current global practices that can be leveraged to promote effective and equitable care for IBD patients, and produces unique insights that drive greater awareness of the unmet needs of IBD patients.

The insights in this report are based on an extensive literature review and desk research, in-depth interviews with relevant clinical experts, scientific leaders, policy stakeholders, and patient advocates. The editorial team at Economist Impact would like to thank the following individuals (listed alphabetically) for generously contributing their time and insights, which have been critical to the creation of this report:

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Executive summary

Inflammatory bowel diseases (IBD) are chronic immune-mediated disorders affecting the gastrointestinal tract. Ulcerative colitis (UC) and Crohn's disease (CD) are the most common IBDs. Patients with IBD typically present with abdominal pain, vomiting, diarrhoea, and in the case of UC, rectal bleeding. In the long term, patients with IBD have an increased risk of cancer.[1] The origins of IBD can be traced to a complex interplay of genetic and environmental factors coupled with abnormal immune responses to microbes in the gut.[2]

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The rising burden of IBD

According to 2019 estimates, there are about 4.9m people with IBD in the world.[3] Currently, high-income countries in Asia Pacific, North America and Western Europe have the highest age-adjusted prevalence of IBD.[3] While originally considered a disease of the West, incidence in Asia and Africa, as well as among Asian immigrants to western countries, has been rising; Asia, North Africa and the Middle East have seen the highest increase in age-adjusted prevalence over the last three decades.[3]

While mortality rates for IBD are low, morbidity and disability are high. Over a 10-year period, the risk of a colectomy in patients with UC is ~13% and risk of surgery in patients with CD is ~40%.[4] Extraintestinal manifestations, where the disease affects parts of the body other than intestines, occur in about 17% of patients with UC and 37% of patients with CD, affecting joints, skin, eyes or the liver.[5,6] Venous blood clots, anaemia, and osteoporosis are more common in patients with IBD. The risk of cancer is increased in IBD—patients with UC have a 2.4-fold higher risk of colorectal cancer compared to the general population.[5]

The impact of the disease on quality of life and mental health is also significant. Fatigue is a disabling symptom, occurring in ~72% of patients with active disease and almost half of patients in remission.[7] Anxiety and depression occur in ~20% of patients with IBD and are higher in those with active, rather than inactive, IBD.[8] Therefore, early diagnosis and appropriate treatment are crucial to inducing disease remission and reducing disability.

Barriers in the IBD care pathway

Unfortunately, delayed diagnosis remains a common problem due to the lack of awareness and non-specific symptoms of IBD. Specialist evaluation is necessary to confirm the diagnosis, but is often a challenge due to long wait times and geographical barriers. One in four people wait longer than seven and 15 months for a diagnosis of UC and CD, respectively.[9] Delayed diagnosis leads to more severe disease and doubles the patient's risk of intestinal surgery, emphasising the need to ease these bottlenecks and streamline the care pathways.[9]

The last two decades have seen an explosion in the therapeutic arsenal for IBD; the development of biologics and novel oral agents has revolutionised the management of the condition. A sizeable number of patients can achieve mucosal healing and endoscopic remission with these drugs.[10, 11] These advances have supported improved treatment goals that now include complete clinical, biochemical and endoscopic remission of IBD. The International Organization for the Study of IBD (IOIBD) has established the Selecting Therapeutic Targets in IBD program (STRIDE). The latest STRIDE-II guidelines recommend a treat-to-target approach (T2T) for IBD, the long-term goals of which are achieving complete endoscopic remission and normalisation of quality of life.[12]

Though responses to novel agents are encouraging, significant gaps remain. The diversity of agents available for the treatment of IBD lags far behind other inflammatory illnesses like rheumatoid arthritis and psoriasis. Challenges in accessing novel agents, including delays in regulatory approval, reimbursement issues and administrative requirements, are major impediments to therapy. Furthermore, clinical practice varies widely among physicians in terms of patient choice, treatment use, monitoring and escalation. While decreases in hospitalisation and surgery have been observed with the use of biologics in clinical trials, real-world evidence does not consistently corroborate this finding. Suboptimal drug use in the clinical setting may partly explain these findings, suggesting the need for improved dissemination of guidelines.[13-15] Most importantly, there is a lack of validated predictive markers to identify the optimal novel agent for each patient before commencing treatment. Therefore, drug changes are often required, which can delay recovery and compromise outcomes.

Given the impact of IBD on various facets of patients' lives, multidisciplinary and patient-centric care is critical to improving outcomes. The engagement of specialist IBD nurses has been shown to reduce hospitalisations, and emergency room and outpatient visits, with potential cost savings.[16-18] Nutritionists and psychologists are key multidisciplinary team members in providing holistic care. However, these professionals are not consistently available in IBD clinics due to resource and logistical constraints.

Looking forward

Streamlining the care pathway for IBD

Creating awareness among the public is the most crucial step to ensure that patients with symptoms present early to the healthcare system. To facilitate early diagnosis, frontline physicians need to be educated on the red flag symptoms of IBD, and on extraintestinal and other non-specific symptoms that could signal this diagnosis. Using non-invasive tests like faecal calprotectin to rule out IBD in selected patients can reduce the number of specialist referrals and wait times. Access to advanced therapies should be streamlined to ensure patients receive optimal treatment and have greater chances of biochemical and endoscopic remission. Treatment should be offered by a multidisciplinary team with specialist nurses, nutritionists and psychologists. Shared decision-making should be supported to ensure that the patient's personal treatment goals are met.

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Engaging technology

Technology should be harnessed to build capacities and capabilities in health systems, improve patient-centric care and reduce disease burden on patients. The explosion of mobile health apps in IBD has helped with providing educational materials, increasing disease awareness, better treatment monitoring and improving access to psychosocial support.

Investments should be made to facilitate information exchange between these apps used by patients and electronic health records to ensure that this information can be easily used for patient care. Telehealth visits for selected patients can improve patient experience, as well as reduce health system burden and costs.

Investing in research

Despite the advent of many effective novel agents, there is a dearth of predictive models that can identify the most suitable therapies for each patient. Research into precision medicine for IBD, including predictive models and artificial intelligence (AI)-based multi-omics analysis, should be supported. The development of non-invasive modalities to assess treatment response and mucosal healing will lower health system burden and improve patient compliance with the T2T approach. Investments should continue to be made in developing newer therapies with better response rates. Fundamental research into the prevention of IBD is still the ultimate goal.

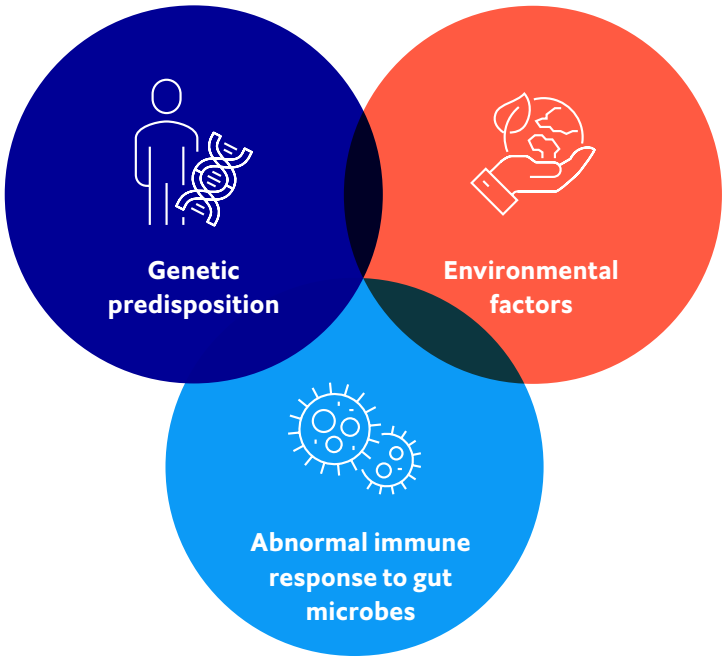
As health systems face growing waitlists, human resource constraints and a plethora of new medical conditions post-pandemic, there is an imminent need to optimise care for IBD to improve patient outcomes and reduce the system-wide burden. Such efforts should be combined with capacity building and the development of cross-cutting solutions that can eventually be expanded to other chronic diseases.

Introduction

Inflammatory bowel diseases (IBD) are a group of chronic immune-mediated conditions causing inflammation of the gastrointestinal tract. IBD can occur at any age, with disease onset most common between 20 and 40 years of age. A second peak of incidence occurs among older adults, typically between 60 and 70 years of age.[2] IBD is broadly classified into Ulcerative Colitis (UC) and Crohn's Disease (CD). UC affects the colon, while CD can affect any part of the intestine. Both diseases present with abdominal pain, vomiting and debilitating diarrhoea; bloody stools are seen exclusively in UC. Some patients may also develop extraintestinal manifestations (EIMs) affecting the joints, skin, eyes and liver. In the long term, patients have an increased risk of cancer.[2]

An interplay of genetic and environmental factors coupled with abnormal immune responses to microbes in the gut results in the development of IBD.[2, 19-21] Rising incidence and prevalence of IBD is seen with industrialisation. Changes in diet and environment along with improved awareness, better diagnosis, treatment access and longevity are believed to fuel this rise.[2]

Figure 1: IBD is caused by an interplay of genetic, environmental and immune factors[2, 19-21]



The 2019 Global Burden of Disease (GBD) data estimates that 4.9m people live with IBD globally.[3] The highest prevalence of IBD is currently seen in high-income countries in Asia Pacific, North America and Western Europe. However, newly industrialised countries are quickly catching up, with a rising prevalence of IBD noted since the turn of the 21st century.[3, 22] Asia, as a continent, has the highest number of patients with IBD in the world.[22] Modelling data suggests that between 2020 and 2035, there will be a quadrupling of patients with IBD in India, accounting for almost 2.2m people. Countries such as Iran and regions such as North Africa and the Middle East will see about a two-fold increase in prevalence.[23] The incidence and prevalence of IBD in children is also rising. IBD is typically diagnosed in children before complications occur, but the trade-off is the intensity of the health and economic burden of a paediatric IBD diagnosis. Being a chronic disease with high levels of morbidity and disability, the rising prevalence of IBD, especially in developing countries, is likely to burden health systems and significantly impact individuals' quality of life.

The NHS in the UK estimates that the number of people on the waitlist for consultant-led elective care has increased by three million since the start of the pandemic. Median wait time for gastroenterology care in England has nearly doubled since the start of the pandemic.

The past two decades have been characterised by a fast growing therapeutic armamentarium for IBD. The development of biologic agents has dramatically modified the treatment landscape by reducing the reliance on steroids and moving treatment from the inpatient to the outpatient setting. The option of subcutaneous administration of certain biologics is even facilitating a shift towards home-based care in selected patients. The development of oral small molecules has the potential to further reduce the disease burden for patients.

Though the robust development of therapeutics promises reductions in disease burden, the diversity of agents available is far less than other inflammatory diseases like rheumatoid arthritis and psoriasis. There is also significant variability between different countries in the use of existing novel agents. This is related to regulatory, reimbursement, and other access challenges, such as administrative demands. Additionally, less than half of the patients treated with novel agents will achieve remission. Though uncommon, long-term complications of opportunistic infections remain significant concerns for patients on therapy.

Besides the limitations of therapy itself, the delivery of care for IBD is facing major challenges in the wake of the pandemic. The National Health Service (NHS) in the UK estimates that the number of people on the waitlist for consultant-led elective care has increased by three million since the start of the pandemic.[24] Median wait time for gastroenterology care in England has nearly doubled since the start of the pandemic.[25] To expedite care for patients with IBD, there is an imminent need to reduce reliance on outpatient visits and expand novel ways of care delivery and remote monitoring. Such efforts can be extrapolated to other chronic diseases, eventually lowering the overall burden on the healthcare system.

This white paper will explore the current status of IBD globally, comparing and contrasting different regions that are in various stages of the epidemiological shift. The overall health and economic burden of the disease for patients and health systems will be described, highlighting challenges in access to care. The report will conclude by elaborating on the opportunities available for strengthening health systems and improving patient-centric care by embracing innovations in this space.

The rising global burden of IBD

"There is clear evidence that the burden of IBD has been rising since the last century," observes Julian Pánes, Professor of Medicine and the former Chief of the Department of Gastroenterology at Hospital Clinic de Barcelona. The longest continuous epidemiological analysis of CD from Cardiff in Wales, starting with an initial case report of ileitis in 1932, is the typical representation of the progression of IBD incidence and prevalence (see Figure 2).[26]

Figure 2: Change in epidemiology of CD over time in Cardiff, Wales
Incident cases per 100,000 population

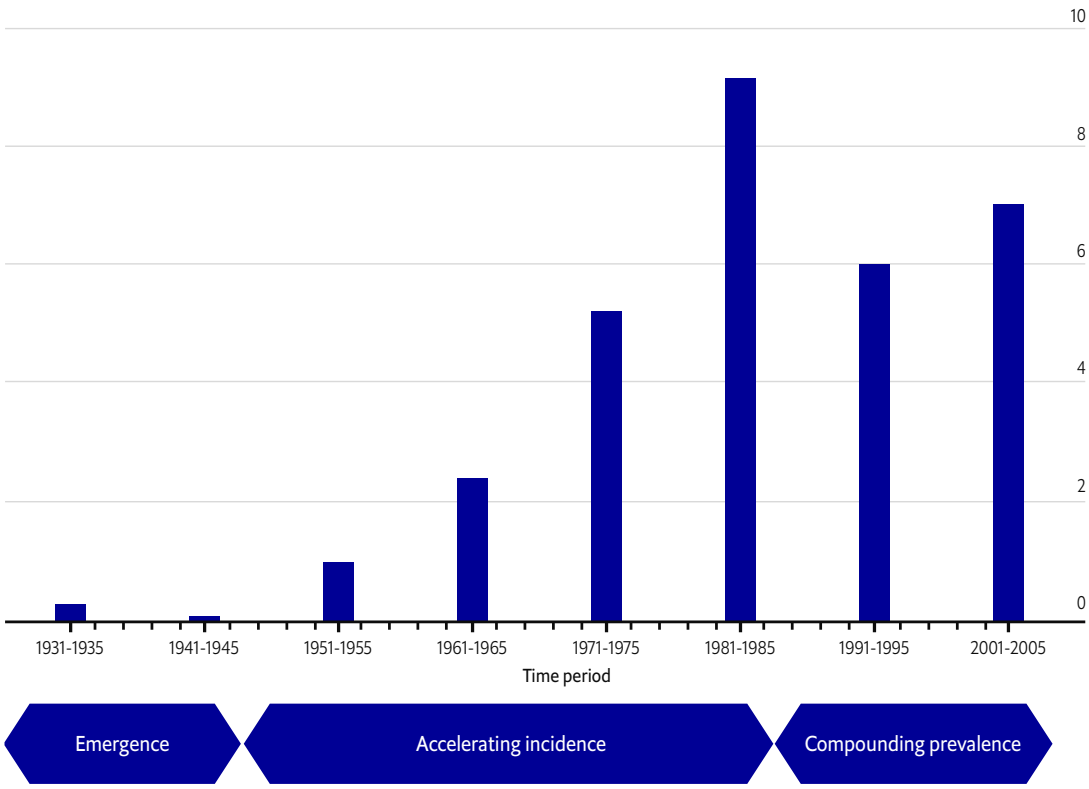
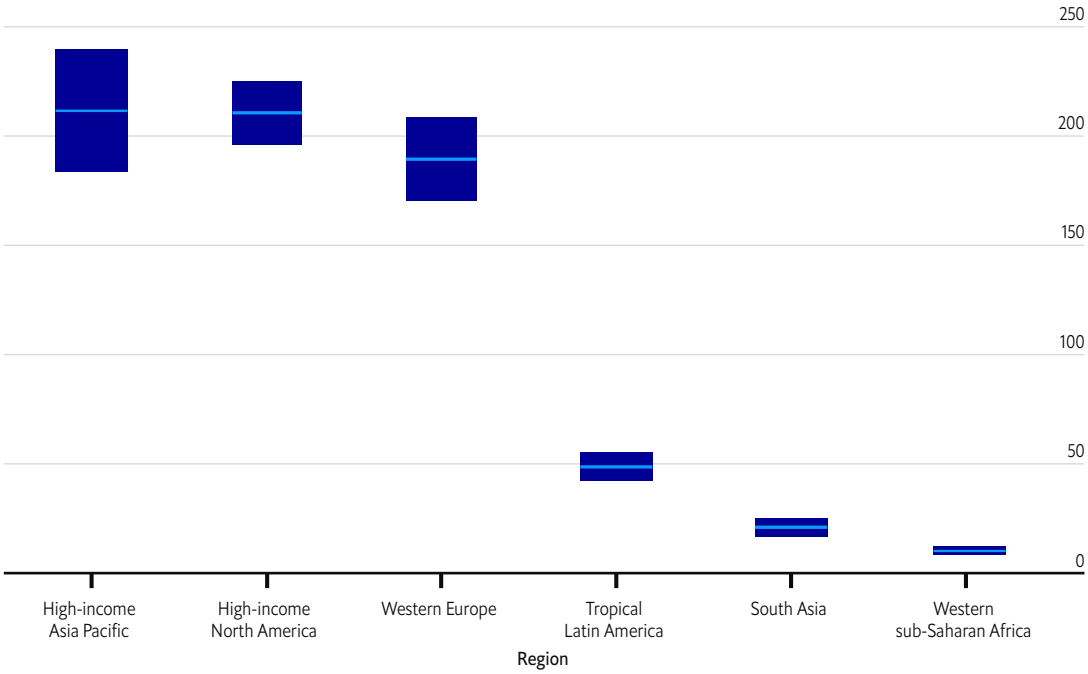


Figure 3: Age-standardised prevalence of IBD across selected regions of the world
Age-standardised prevalence in people per 100,000



Over the past three decades, there has been a 1.8-fold increase in the number of people living with IBD globally. Prevalence is highest in high-income countries; in North America, Asia Pacific and many countries in Europe, prevalence exceeds 0.3% of the population.[20] Certain pockets of people such as in the Lothian region of Scotland and parts of Canada have a notably high prevalence estimated at 0.75% of the population.[27] "In Canada, we have one of the highest incidence rates of IBD in the world," notes Vipul Jairath, holder of the John and Susan McDonald Endowed Chair in IBD Clinical Research at Western University and Professor of Medicine at the Schulich School of Medicine and Dentistry, Canada. "Ten years from now, it is projected that one percent of the Canadian population will have IBD," he adds.

Although IBD was originally considered to be a disease affecting western populations, there has been a rapid rise of IBD in Asia, Africa, and among Asian immigrants to Western nations since the turn of the 21st century. "Several aspects, including lifestyle, environment and medication use, appear to contribute to the rise of IBD with industrialisation, but there are still gaps in our understanding of this phenomenon," says Prof Pánes. Over a 15-year period (1998 – 2012), Brazil saw an Annual Percentage Increase (API) of 11% for CD and 15% for UC incidence.[28] Between 1990 and 2019, China experienced an API in incidence of IBD of 1.2% for women and 0.95% for men.[29] "A small increase in incidence in populous countries like China can make a huge difference to the overall number of patients," remarks Johan Burisch, Gastroenterologist at the Copenhagen Center for Inflammatory Bowel Disease in Children, Adolescents and Adults at Hvidovre Hospital, Hvidovre, Denmark.

Over the past two decades, both the incidence and prevalence of paediatric IBD are also rising. In a systematic review of 131 studies from 48 countries evaluating the epidemiology of paediatric IBD, 84% of studies showed an increasing incidence and 100% of studies showed a rising prevalence among children.[30]

The paradox of decreasing mortality and rising disability

While the total number of deaths due to IBD has increased by 69% in the past three decades, the age-standardised mortality has decreased by 13%, reflecting advances in therapy.[3] "The mortality associated with IBD is very low, but it's a disease that heavily impacts on the quality of life and functioning of the patient," remarks Prof Pánes. According to the 2019 GBD data, the disability-adjusted life years (DALYs) due to IBD has increased by 30% since 1990, reaching 1.62m in 2019. The age-standardised DALY rates decreased over the same time period, with an estimated annual percentage decrease of 1%. The improvements in age-standardised mortality and disability rates point to better treatment. However, given the increasing longevity of patients with IBD, overall DALYs are expected to rise further due to greater comorbidities with advancing age.[3]

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Prof Julian Pánes, Professor of Medicine and the former Chief of the Department of Gastroenterology at Hospital Clinic de Barcelona, Spain

Limitations in the estimation of disease burden

Several hospital-based or population-based national and international registries have been developed to estimate IBD burden; however, inadequate diagnosis, lack of reporting and limitations of the population size represented by the registries cause significant gaps in data.[31-33] "Lack of a dedicated workforce for management of registries is a major barrier to their expansion," observes Edouard Louis, Head of the department and Professor of Gastroenterology at University Hospital CHU of Liege, Belgium. The NHS in the UK has attempted to overcome these challenges by enabling patients to register into their IBD registry directly through an online enrolment form. Patients can also update additional health information directly on the "My IBD registry" webpage. Over 2,200 people in the UK joined the NHS IBD registry in the year 2022 using the online registration process.[34]

Surgery for IBD

Clinical trials have shown a reduction in surgery rates after treatment of IBD with biologics.[13] However, real-world evidence has been conflicting. A population-based interrupted time-series analysis in Canada, performed between 1995 and 2012, did not show a reduction in surgery in CD or UC after the introduction of anti-Tumor Necrosis Factor (TNF) agents in the market.[14] Another study compared outcomes of CD across Western and Eastern European centres using the population-based Epi-IBD cohort, which prospectively follows patients diagnosed with IBD in 2010 and 2011. Even though patients in Western Europe compared to those in Eastern Europe were more likely to receive biologics (33% v 14%) and immunomodulator therapy (66% v 54%), surgical rates did not differ significantly between the two groups over 5-years of follow-up.[15] On the contrary, a systematic review of 44 population-based cohort studies evaluated the patient-level cumulative risk of surgery between 1989 and 2019; data showed that the short and long-term risk of surgery in IBD had declined by 25-50% in the most recent two decades compared to prior decades. There is a need for more data on individual patient-level risk of surgery to accurately estimate trend of surgery rates.[4]

Colectomy, a surgical procedure in which the entire large intestine is removed, is required in ~20% of patients with extensive UC, 8% of patients with UC restricted to the left side of the colon, and 5% of patients with inflammation of the rectum and anus alone. The need for colectomy is higher in those with extensive disease and those that do not experience a mucosal remission after treatment.[5] CD can affect any part of the gastrointestinal (GI) tract; the most common location of the disease is in the distal small intestine. About 15-25% of patients with CD develop strictures that cause obstructions in the GI tract or fistulas, which are abnormal connections between the GI tract and other organs or the skin.[35] Surgery is often required in stricturing and fistulising disease. Due to various factors such as poor nutrition, inflammation, steroids and immunosuppressive therapy, postoperative complications for patients with IBD are higher than other bowel conditions, causing significant morbidity and disability.[36] There is a pressing need to develop new therapies that further reduce the need for surgery.

Hospitalisation due to IBD

With the advent of novel treatments and intensive disease monitoring, management of moderate to severe IBD is gradually transitioning to the outpatient setting in the Western world. However, newly industrialised countries continue to see rising hospitalisation rates.

A systematic review of temporal trends of global hospitalisation rates for IBD in the 21st century, which included 26 population-based studies from 35 countries, found the following results. Hospitalisation rates were stable over time for high-income countries in North America and Northern Europe. On the other hand, hospitalisation rates for countries in Asia, the Middle East and Latin America were rising at an annual rate of 8.3% for CD and 4% for UC. The rising incidence of IBD, lack of awareness, and barriers to accessing novel agents in newly industrialised countries contribute to the rising hospitalisation rate.[37]

Extraintestinal manifestations, comorbidities and cancers

EIMs occur in up to 17% of patients with UC and 37% of patients with CD.[5,6] Arthritis is the most common EIM. Others include inflammatory manifestations of the eye, skin, liver or lung. The risk of venous blood clots increases three to four-fold in patients with IBD. Anaemia is frequently observed among patients with UC upon diagnosis, but the rate decreases with time. Those with IBD receiving steroid therapy are at risk for developing osteoporosis.[5,6]

Risk of cancer also increases with UC and CD. Patients with UC and CD are at higher risk for colorectal cancer (CRC)– the risk is cumulative over time.

The overall risk of CRC in UC is estimated at 1.6% during the first 14 years after diagnosis, which is 2.4-fold higher than the general population. Those with UC and EIM involving the bile ducts are also at risk for a type of biliary cancer called cholangiocarcinoma.[5] Small bowel adenocarcinoma is rare, but patients with CD have a 3-fold higher risk, especially if they have stricturing disease. The prognosis of this cancer is poor with an estimated 5-year survival of about 30%.[38, 39]

"Patients may often look fine but are living with a chronic debilitating disease."

Prof Vipul Jairath, Professor of Medicine at the Schulich School of Medicine and Dentistry, Canada

Impact of IBD on health-related quality of life and mental health

"Patients may often look fine but are living with a chronic debilitating disease," Prof Jairath says, substantiating the description of IBD as an invisible illness. "People are in their 20s and 30s when they are diagnosed with IBD. These are important years for career development and starting a family but having a disease flare greatly impacts quality of life, work and social interactions," Dr Burisch emphasises. Prof Louis agrees. "Overall quality of life is quite strongly impacted by this disease. Abdominal pain, diarrhoea, not being able to control your bowel movements, all these things are very difficult to live well with. Family life, social life, working life, all aspects are impacted," he says.

THE EFFECTS OF IBD EXTEND BEYOND THE GUT

The impact of IBD on quality of life and mental health is higher for those with active disease than for patients in remission, reiterating the importance of early and effective treatment. The impact of disease activity on quality of life is related to multiple dimensions such as self-esteem, relationships, pain, hygiene and psychological distress.[40]

Fatigue is an important problem affecting quality of life in patients with IBD.[41] A systematic review of 20 studies estimated that almost half of patients with IBD experience fatigue; 72% of patients with active disease and 47% of patients in remission reported fatigue. These figures were comparable to fatigue among patients with cancer, estimated at 49% and much higher than fatigue in the general population, which is estimated at 5%.[7]

Anxiety and depression are common mental health challenges faced by patients with IBD. A systematic review demonstrated that the prevalence of anxiety among patients with IBD was almost twice that of healthy controls (19.1% versus 9.6%), and that of depression was about 1.5 times that of healthy controls (21.2% versus 13.4%). Those with active disease had significantly higher rates of anxiety (66.4% v 28.2%) and depression (34.7% v 19.9%) compared to those with inactive disease.[8]

In addition to the impact on patients, IBD affects the quality of life and mental health of their family and caregivers. Parents of children with IBD experience fears and concerns around the side effects of treatment, consequences to schooling and the long-term health impact of the illness.[42]

The economic burden: moving from inpatient to outpatient costs.

Over the years, the economic burden of IBD has shifted away from hospitalisation towards outpatient and medication costs due to newer and more effective treatments.[43] However, the incremental costs of IBD remain very high. A systematic review of 64 studies in the period of 1985-2018 estimated the annual healthcare costs for IBD across different continents. The annual healthcare cost of CD in Asia was US$4,417, in Europe, it was US$12,439 and in North America, the cost was US$17,495. Corresponding costs for UC were US$1,606, US$7,224 and US$13,559, respectively. Medication costs were the largest contributor.[44]

"The economic burden of IBD has never been reliably calculated, simply because there are many indirect costs, and usually they are not well integrated or accounted for," shares Prof Louis.

A systematic review identified 11 studies reporting on indirect costs in IBD, all of which were from North America, Europe or New Zealand. There was high variability in how the costs were estimated. A wide range of yearly indirect costs per patient were identified that ranged from US$926 for lost wages to US$6,583 including lost productivity and absenteeism as a result of UC. The costs for CD were greater, ranging from US$1,159 to US$14,136 for the same categories.[46] A study assessing the cost of IBD in Portugal for 2019 estimated the total cost to be US$156m per year, of which a sizeable 31% represented indirect costs that included patient work absences, caretaker work absences, presenteeism, early retirement and premature death.[47]

Figure 6: Lifetime total direct cost (US$) in patients with CD and UC categorised by location of spending

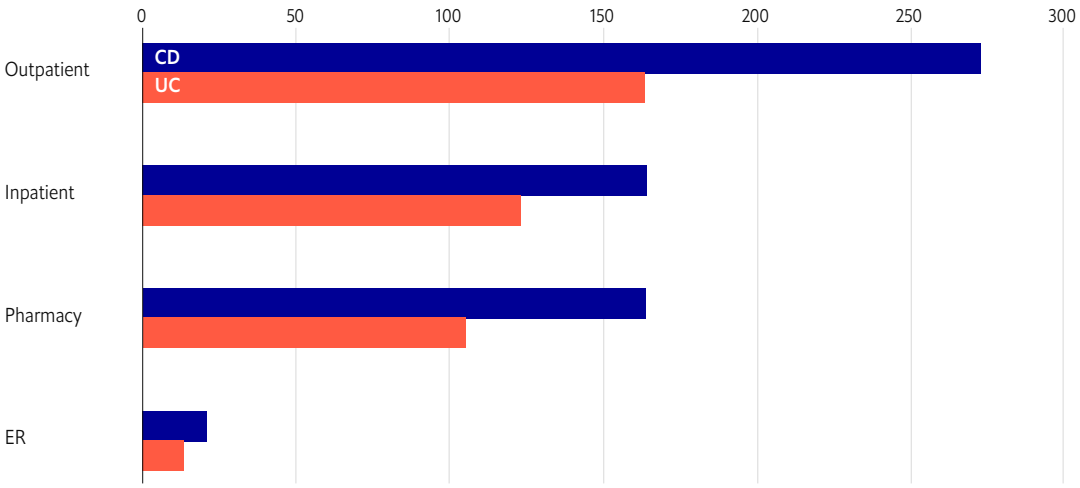
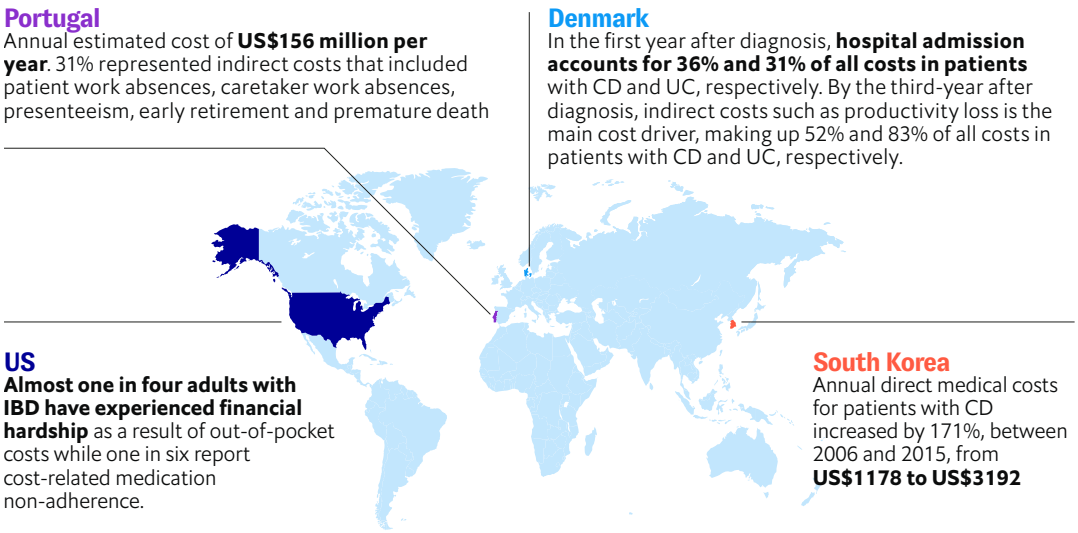


Figure 7: The economic burden of IBD[47-50]



"The main cost drivers in IBD are the increasing patient pool, increasing use of novel agents and the need to use many novel therapies before finding the right one," opines Dr Burisch. "There are really no good ways to predict which patients will respond to which novel therapy," reiterates Prof Pánes. A systematic review of cost-effectiveness of anti-TNF therapies performed in 2014 showed that at a willingness to pay threshold of €35,000 per quality-adjusted life year (QALY), these therapies were cost-effective for remission induction in severe CD and for the treatment of severely active UC.[51] However, the cost-effectiveness of maintenance therapy remains unclear.[52] Some data suggest that using Therapeutic Drug Monitoring (TDM) to optimise the use of anti-TNF agents in the maintenance phase can help to reduce costs. The use of TDM for dose intensification in patients who lose response to anti-TNF agents has been shown to decrease costs by around 35% compared to empirical intensification.[53] Recent data from Canada demonstrate the cost-effectiveness of using a treat-to-target (T2T) approach.[54, 55] Dr Burisch notes that currently available data studying cost-effectiveness of biologics are based on short-term follow-up. Longer follow-up and real-world evidence is necessary to more accurately assess reductions in complications such as fistulas and need for surgery, but these data can be challenging to collect. Such data would provide crucial information on the true cost-effectiveness of treatments, assisting decision-makers to make more informed reimbursement policies.

Clinical care for IBD: an evolving story of success and challenges

IBD diagnosis, specialist referrals and pitfalls

Patients with IBD usually present with abdominal pain, vomiting and diarrhoea – with or without bloody stools. As Prof Jairath notes, awareness of IBD among the public is low, and patients often attribute their symptoms to dietary intolerances or irritable bowel, resulting in delayed seeking of medical help. A study in South Korea showed that 41% of patients surveyed visited a hospital six months after they first noticed the symptoms of IBD; 75% of them cited the main reason for delayed medical evaluation was a lack of knowledge and awareness of the disease.[56]

In Australia, the Global Ulcerative Colitis Narrative Survey revealed that almost half of the patients reported that receiving a UC diagnosis took more than one year.

Once patients present to the medical system, there is wide variability across countries in how long it takes to have a diagnosis and receive specialist care. Dr Burisch describes high levels of awareness of IBD among primary care physicians (PCPs) in Denmark, a country with a high prevalence of the disease. "PCPs know that a young individual with abdominal symptoms could have IBD. The average time from developing symptoms to seeing a GP and having a diagnosis is about three to six months. Specialists can be accessed within a month or two," he says. In comparison, diagnosis is often delayed in Australia, especially in rural and remote areas, where awareness and access are poor. "Delayed diagnosis is an issue in Australia – where you are located makes a big difference. Access to care in rural settings significantly lags behind urban areas. Patients often go along the diagnostic pathway for eating disorders before they get to the right person who identifies the problem," says Leanne Raven, Chief Executive Officer of Crohn's & Colitis Australia (CCA). In Australia, the Global Ulcerative Colitis Narrative Survey revealed that almost half of the patients reported that receiving a UC diagnosis took more than one year.[57]

The type of symptoms at initial presentation is another important factor determining the time to diagnosis. Prof Pánes notes the stark difference between the time to diagnosis of UC, which is about four months, and CD, which is about 18 months, across Spain, France and Italy. He explains that this disparity is because patients with UC have bloody diarrhoea, which is an alarming symptom, whereas bloody stools are rare in CD. "In Spain, almost 20% of patients with CD are only diagnosed by the time they have complications like strictures or fistulas," Prof Pánes shares. Prof Jairath explains that the diagnosis of IBD is not always straightforward. "Sometimes symptoms can be non-specific like weight loss and fatigue, or in paediatric patients, growth delays. EIMs may occur before bowel symptoms and cause challenges in making the diagnosis," he says.

To make a diagnosis of IBD in a patient presenting with abdominal symptoms, infections need to be ruled out, inflammation should be demonstrated on endoscopy and confirmed by biopsy. The need for specialist evaluation and invasive procedures such as endoscopies and biopsies are often a deterrent to early diagnosis, especially among remote populations.[58, 59]

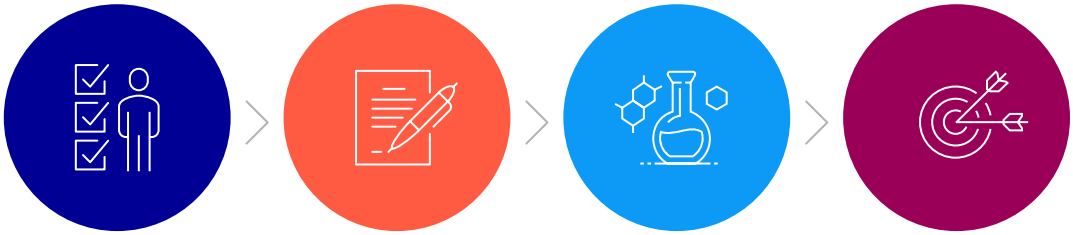
Therapeutic advances in IBD: great strides made but miles to go

The development of biologics, including anti-TNF antibodies, anti-integrins and anti-interleukin 12/23, as well as oral small molecule Janus Kinase (JAK) inhibitors, has revolutionised the landscape of IBD management over the past two decades. These agents achieve significantly higher rates of complete clinical and endoscopic remission of IBD compared to placebo.[60] Prof Louis recalls an interaction with an older patient in the 1990s, which illustrates the progress made. "He got the disease in the 60s, and what was said to him at the time was, 'you have Crohn's disease, you shouldn't try to work, stop your studies, do not try to have a family, all your life you will have to take care of your disease,' and that was the message then. Thankfully, treatment strategies have evolved and have changed the reality for patients with the most severe Crohn's disease."

Treat to Target (T2T) approach for IBD and barriers to implementation

With advances in therapy, the goal of treatment in IBD has moved from mere symptom control towards complete clinical, biochemical, and endoscopic remission. The Selecting Therapeutic Targets in IBD Program (STRIDE) established by the International Organization for the Study of IBD (IOIBD) provides a position statement for choosing appropriate targets for the management of IBD. This T2T approach has been shown to improve outcomes and reduce hospitalisations.[61] The STRIDE-II recommendations describe clinical response as an immediate target, clinical and biochemical remission as intermediate-term targets, and endoscopic healing and normalisation of quality of life as long-term targets in the management of IBD (see Figure 8).[12] While histological remission (the absence of inflammation and ulceration/erosion in a biopsy sample examined under a microscope) is not expressly stated as a treatment target, STRIDE-II recommends considering this as an adjunctive measurement to estimate the depth of treatment response.

Figure 8: The STRIDE-II criteria for a T2T approach in IBD

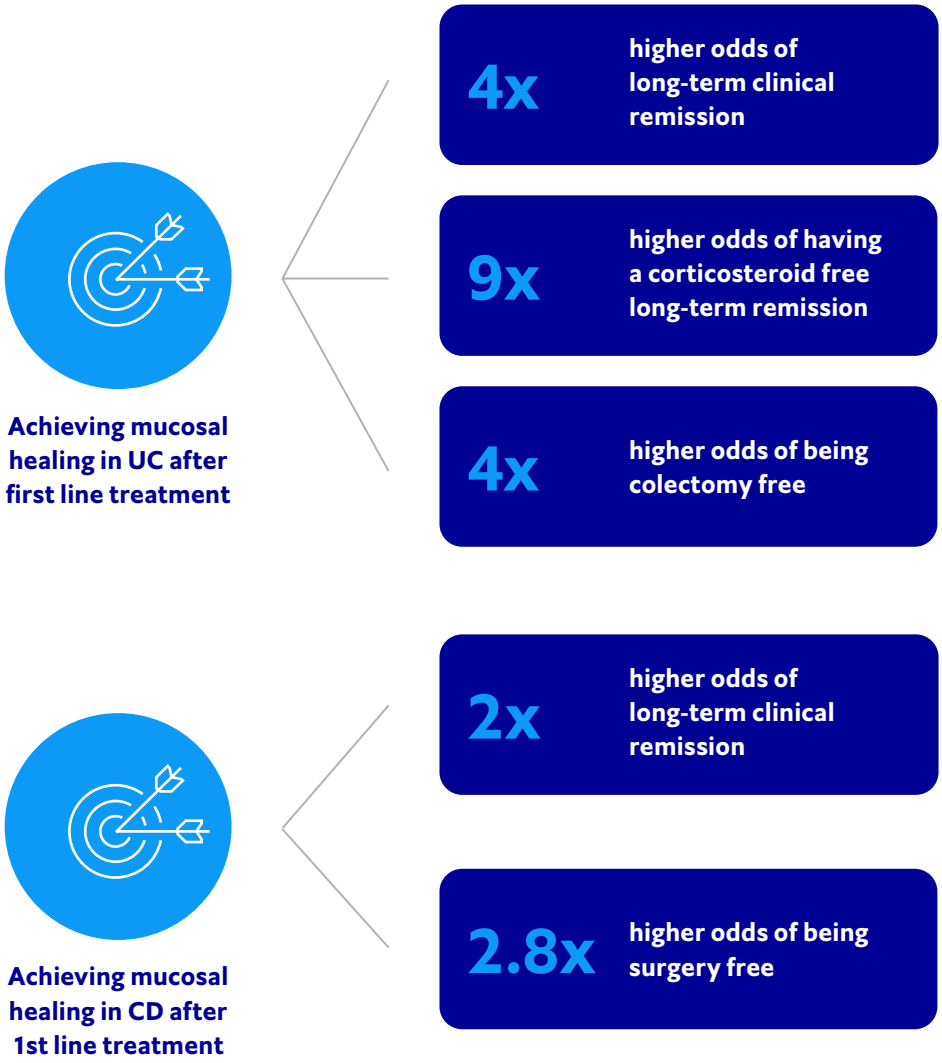


IMMEDIATE TARGET	IMMEDIATE TERM TARGET	IMMEDIATE TERM TARGET	LONG TERM TARGET
Clinical response	**Clinical remission**	**Biochemical remission**	**Mucosal/ endoscopic healing & normalisation of quality of life**
Defined by patient reported symptoms or disease activity scores	Defined by patient reported symptoms or disease activity scores	Normalisation of C Reactive Protein (CRP) and ffaecal calprotectin level of 100-250µg/g	Defined by endoscopic findings & quality of life measurements

In the past, the term mucosal healing was mostly synonymous with endoscopic healing. A systematic review and meta-analysis in 2016 showed that achievement of mucosal healing (endoscopic healing) after initial treatment in UC is associated with about four times the odds of having long-term clinical remission, nine times the odds of having corticosteroid-free long-term remission, and four times the odds of being colectomy free.[62]

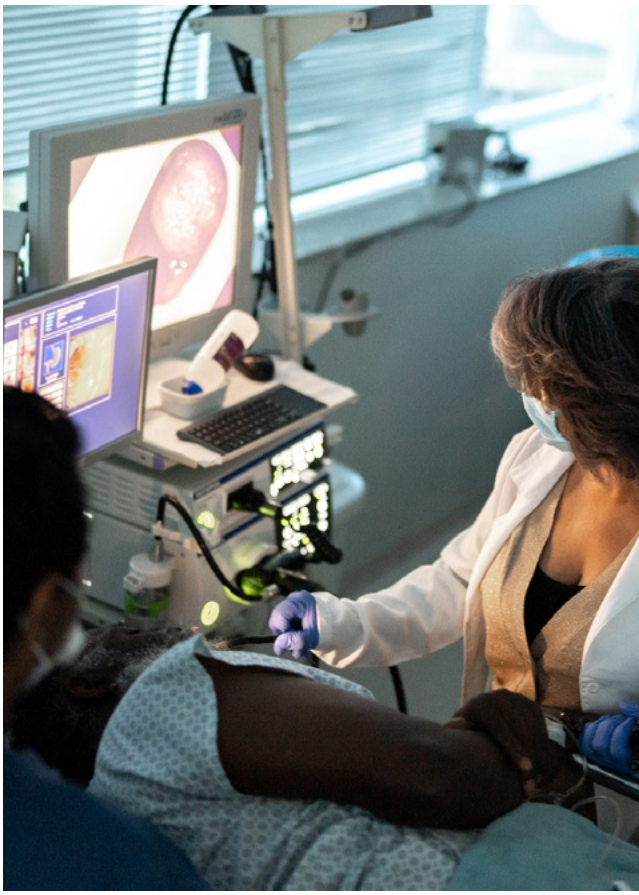
Another meta-analysis showed that patients with CD who achieved endoscopic healing after first-line treatment were twice as likely to achieve long-term clinical remission. These patients also had 2.8 times lower odds of needing surgery as compared to patients who did not achieve this end-point.[63]

Figure 9: Mucosal healing (endoscopic healing) and long-term outcomes in IBD



Histological inflammation may still exist in about 30% of patients who have achieved clinical and endoscopic remission. Data on histological remission and the impact on long-term outcomes in IBD are still emerging. Prof Louis informs that "The importance of histological healing has become more and more clear in patients with UC. In routine practice, we use it regularly in Belgium as part of the assessment." A meta-analysis using data from 2,806 patients across 28 studies noted that UC patients with persistent histological findings of inflammation had 2.4 times the odds of relapse compared to those that achieved histological remission.[64] However, the impact of histological remission on outcomes in CD is unclear. In addition, there are no uniformly accepted and validated criteria for the determination of histological remission and the optimal management of patients who do not achieve this end-point is unknown. "If we have a patient on a biologic that has endoscopic healing, but histology still shows inflammation, we are not sure whether to change therapies. We need more research in this area," says Dr Burisch.

There are several barriers to be overcome for adopting a T2T approach. The reliance on invasive procedures such as an ileocolonoscopy makes the assessment of mucosal healing a challenge. "Academic centres in Denmark routinely perform endoscopies to assess treatment response in IBD, but this is not the practice outside of university hospitals as wait time has increased, especially after the pandemic," says Dr Burisch. The exact timing for such assessment also remains unclear, although experts propose a timeframe of six to nine months after the start of therapy. Non-invasive tests that correlate strongly with mucosal healing remain to be identified. Biomarkers such as C-Reactive Protein (CRP) and faecal calprotectin, while helpful as adjunctive indices to assess disease relapse and treatment response, do not consistently correlate with endoscopic healing.[65]



Different chemokines and adipokines have been studied as potential peripheral blood markers of persistent mucosal inflammation, but none have proven a consistent and strong association.[66]

Patient compliance is another important factor impacting the T2T approach. Patients with IBD often feel stigmatised and heavily burdened by their disease. Once symptom control is achieved, they may be less motivated to engage continuously with the health system in the intensive way that is required for the T2T approach. A study on patient acceptance of the T2T approach showed that better self-reported medication adherence was associated with better acceptance of a T2T approach.[67] The financial and budgetary impact of using biologics and an intense T2T approach for patients is also significant.[68]

Access to novel agents for therapy

"The biggest innovation in IBD is the development of better therapies. We have drugs that can be life-changing, biologics particularly," remarks Prof Jairath. However, there are considerable delays and barriers for patients trying to access these novel agents.

In Canada, it takes over a year for a drug to receive regulatory approval from Health Canada. Following this, Health Technology Assessments (HTA) are conducted by the Canadian Agency for Drug and Technologies in Health (CADTH), which take an average of seven months. If approved by the CADTH, the pharmaceutical company still needs to negotiate a price with the pan-Canadian Pharmaceutical Alliance (pCPA); this process is expected to be completed in six months.[69] Then, the drug may be accessed through the public system. However, this sequential approval and listing mechanism has seen progressive delays over the last decade, indicating a need to streamline the process.[70] Clinical trials and compassionate use programmes enable access to drugs that are yet to be approved in Canada. "Out-of-pocket expenses depend on the kind of health coverage; some co-pay may be required," according to Prof Jairath.

The European Federation of Pharmaceutical Industries and Associations Waiting to Access Innovative Therapies (EFPIA W.A.I.T.) survey examines the wait time for patients to access innovative therapies across 39 countries in Europe after regulatory approval is obtained through the European Medicines Agency (EMA). In 2021, the time to reimbursement after regulatory approval of drugs varied from 133 days in Germany to 899 days in Romania.[71] Once reimbursement is approved, access to drugs appears to be streamlined in countries like Denmark and Spain. Dr Burisch describes the health system in Denmark as being liberal in funding therapies and providing clear guidance on what agent to use in which line of treatment. The situation appears to be comparable in Spain. "Even though novel agents are easily accessible, we seldom see indiscriminate usage that doesn't conform with guidelines," Prof Pánes remarks.

In some other countries, even after regulatory and reimbursement approval is obtained, administrative and bureaucratic challenges can limit access. For example, in Taiwan, a pre-application is required for approval for biologic therapy in a specific patient with IBD. Approval is only granted after six months of first-line treatment failure with an immunomodulator and/or steroids. This can be a significant challenge in patients who need rapid escalation of therapy or a step-down approach. Ms Raven highlights the inequitable access and administrative difficulties in Australia. "The cost of biologics is decreasing, but there are still pockets of communities, especially children and elderly, who are not receiving the medications. We really need to work out why. The paperwork that specialists must provide to obtain approval for novel agents is rigorous and burdensome, which is one of the impediments to access," she says. In Russia, the lack of comprehensive IBD registries results in a mismatch between the official statistics of the prevalence of IBD and the actual disease burden, often resulting in a shortage of drug supply.[72]

Limitations of novel agents

Modest response rates and lack of predictive tools for response

"We have a plethora of novel treatments for IBD, but they show consistent benefit in only about 20-30% of patients," remarks Dr Burisch. He describes that physicians often end up using up to four different drugs before identifying the one that works. This increases costs and worsens outcomes. There is a need to develop newer agents that can consistently drive mucosal healing, as well as better predictive models for existing therapies.

"We are struggling to find predictors of response to novel agents, but this has proved quite elusive," comments Prof Pánes. "Some predictors that have been identified are simply correlated with severity of disease," he says. In addition, there is limited data regarding the discontinuation of biologics. The optimal patient population where therapy can be safely discontinued and the timing for discontinuation remain unclear.[73, 74]

Risk of long-term adverse events

While biologics have an acceptable safety profile overall, there is an increased risk of opportunistic infections with various virus, bacterial and fungal organisms. Of the biologics, anti-TNF agents appear to have the highest risk of opportunistic infections.[75]

Paradoxical adverse events with the development of new inflammatory disorders have also been noted with anti-TNF therapy.[76] Whether anti-TNF therapies increase the risk of cancer is unclear.[77] The long-term side effects of other biologics and oral small molecules remain to be seen. While there is no data to suggest that the long-term risk-benefit ratio of these agents is unfavourable, the unknowns remain concerns for patients choosing treatment.

Integrated, multidisciplinary and patient-centric care

Studies have shown that a multidisciplinary care team led by a gastroenterologist offers the most effective management approach for IBD. Multidisciplinary care in IBD has been shown to reduce hospital admissions, the complexity of illness upon hospitalisation, and the duration of inpatient stay. In addition, such care provides a patient-centric approach, improving patient satisfaction and outcomes.[78] The IBD Standards Core Statement of the UK has recommendations aimed at improving the provision of safe, high-quality, personalised care for IBD. The statement describes the need for a gastroenterologist-led multidisciplinary team for patient care as a top priority.[79]

Specialist nurses are key members of the multidisciplinary team. "Nurses are better than physicians for certain aspects of patient care," Prof Pánes points out. The introduction of specialist nurses in the IBD clinic has shown to decrease the number of emergency room (ER) visits, unscheduled outpatient visits and hospitalisations. In addition, referrals are expedited, and patients have better access to procedures with reduced wait times.[16, 17] A Nordic study that compared healthcare districts with and without IBD nurses estimated significant cost savings by the introduction of the specialist nurse program.[18] However, despite the demonstrable benefits, there are major gaps in the provision of multidisciplinary care to patients. "Access to dietitians and psychologists is very important but often neglected due to resource constraints in Canada," says Prof Jairath. A 2018 online survey of ~1,000 patients with IBD in Australia showed that few had access to a multidisciplinary team. While all patients had access to a gastroenterologist, only ~32% had access to specialist nurses, ~31% to dietitians, ~26% to pharmacists and a mere 12% to psychologists. The request to access a multidisciplinary team was the most common suggestion from patients to improve IBD care.[80]

A 2018 online survey of ~1,000 patients with IBD in Australia showed that few had access to a multidisciplinary team. While all patients had access to a gastroenterologist, only ~32% had access to specialist nurses, ~31% to dietitians, ~26% to pharmacists and a mere 12% to psychologists.

Patient-centric care in IBD rests on the tenets of increasing patient awareness of the disease, shared decision-making for treatment, empowering patients for self-management between clinic visits, and providing access to a multidisciplinary team for their care. The Global Ulcerative Colitis Narrative Survey in Australia administered seven knowledge questions to participating patients; less than a third of patients were able to answer all questions correctly, demonstrating a significant gap in disease knowledge. Patients in the study desired a better explanation of treatment options, risks and benefits of biologics, concerns around reproduction, and methods to access support from patient organisations.[57] A qualitative study of the experiences of 63 patients with IBD across rural and urban Canada in 2018 highlighted significant gaps in empowering patients to participate in, and drive their own care decisions. A need for more robust and tailored psychosocial support was also identified.[81]

Physical therapists are a less commonly reported member of IBD multidisciplinary teams, but Prof Louis informs us of their role and importance in Belguim. "We have a dedicated programme with physical therapists. Patients with IBD often have a decrease in activity levels that is associated with an increased risk of aggressive disease, higher levels of stress and anxiety. Physical activity may not only regulate some homeostatic processes in the gut, but it may also decrease stress and anxiety, which is very much present in these patients."

The path forward

Optimising IBD care

Facilitating speedy diagnosis and timely specialist referrals

Expediting the diagnosis of IBD requires improved awareness of the disease among the public, policymakers and physicians, coupled with easy access to diagnostic tests. "It is important to work with patient organisations to improve awareness of IBD," notes Prof Pánes. The European Federation of Crohn's and Ulcerative Colitis Associations (EFCAA) organises awareness runs and video campaigns on World IBD day to improve the visibility of the disease.[82] The establishment of disease registries has also increased awareness of IBD, especially in Asia.[83]

"It is important to work with patient organisations to improve awareness of IBD."

Prof Julian Pánes, Professor of Medicine and the former Chief of the Department of Gastroenterology at Hospital Clinic de Barcelona, Spain

As symptoms of digestive disorders are very common, educating general physicians regarding the red flags to expedite IBD workup is critical. "GutSmart" is an online education platform for physicians launched by Crohn's Colitis Australia (CCA), which offers several e-learning modules with IBD-specific foundational and advanced knowledge.[84] The Crohn's and Colitis Foundation in the US has a "Virtual IBD Clinic" programme that supports the training of physicians in the diagnosis and treatment of IBD through interactive case-based modules.[85] Prof Pánes describes the "Red Flags Index", which flags digestive symptoms indicative of IBD for which a specialist referral is indicated.[86] "In our experience, use of this tool reduced the time to diagnosis of CD in half, from 18 to 9 months," he explains.

Access to specialists and endoscopy for diagnostic confirmation can be a challenge, especially among remote and underserved populations. Ms Raven describes the efforts of various stakeholders in Australia in making the home-based faecal calprotectin test accessible for screening patients with possible IBD. Faecal calprotectin is a non-invasive test with extremely high sensitivity in differentiating IBD from functional disorders.

A negative test essentially rules out IBD.[87] The Medicare Benefits Schedule in Australia now covers the test for selected patients with symptoms suggestive of IBD; those with normal levels of faecal calprotectin will not require specialist referrals and endoscopy.[88] This intervention is expected to reduce the wait times for specialist assessment.

Delivering integrated multidisciplinary care

The value of multidisciplinary care in improving patient outcomes in IBD cannot be overstated. Development of IBD care centres, Specialty Medical Homes (SMHs) and IBD Centres of Excellence (CoE) are all important steps in this direction. SMHs comprise a multidisciplinary team that consists of providers, patients and their family. This team works to manage patients with chronic diseases by collaborating with public and/or private insurers within a model that is designed to be patient-centric. SMHs for IBD encompass a multidisciplinary team led by a gastroenterologist. They provide holistic care while encouraging patients to take an active role in their disease management. A retrospective review of 322 patients enrolled in an SMH for IBD care showed a significant reduction in ER visits (47.3%) and hospitalisations (35.9%) compared to the year before SMH enrolment. Treatment in a SMH also improved disease activity and quality of life.[89] IBD CoE are tertiary care institutions with strong multidisciplinary teams. In addition to providing patient care, CoE are engaged in research, education and dissemination of best clinical practices.[78]

Given the value of specialist IBD nurses demonstrated by various studies, many countries are making efforts to increase their representation in multidisciplinary teams. Dr Burisch describes the specialist IBD nurse programme in his institution in Denmark. "About 1,000 patients are enrolled in this programme. They log their symptoms using an app that nurses can access. Patients are colour-coded based on the level and urgency of care they need," he says. "Not all centres in Denmark have this specialist nurse programme," he adds, "but many have them or have a telephone hotline. Nurses use this hotline to triage patients, offer investigations and simple treatments, thereby freeing up physician time for more complex cases." The Australian IBD National Action Plan of 2019 prioritises the recruitment and training of IBD specialist nurses in the country.[88] Ms Raven highlights that CCA has a dedicated nurse to reach out to remote and underserved populations with IBD that lack access to the mainstream healthcare system. According to Prof Jairath, the development of specialist nurse programmes in Canada has been lagging due to insufficient resource allocation. Prof Pánes explains that the healthcare system financing model also impacts the development of specialist nurse programmes. "In the UK, Italy and Spain, nurses take on important responsibilities in patient care. Whereas, in France and Germany, reimbursement for nursing care is limited and hence this space has seen less growth," he says.

"The pandemic has resulted in significant workforce attrition and difficulty recruiting nursing staff for IBD programs," observes Ms Raven. Developing specialist nurse programmes encompassing different inflammatory disorders using similar therapies is one potential solution to mitigate this problem.

Psychological support is an area that is lagging in multidisciplinary care for IBD. Using e-health modalities and self-learning tools can improve access to mental health interventions. The "ACTforIBD" programme draws on acceptance of situations that cannot be changed and builds commitment to improving psychological flexibility. It is offered as an eight-week online module with four hourly sessions led by a therapist and four self-learning sessions. Studies are underway to evaluate the feasibility and efficacy of this approach.[90] If proven effective, such online interventions could change the landscape of mental health management in IBD.

Improving focus on patient-centric care

Patient-centric care in IBD requires a multi-pronged approach. Improving knowledge of the disease and its treatments is the cornerstone of this patient-centric approach. Increased levels of disease-related knowledge among patients are associated with a lower need for step-up therapy in IBD, suggesting that these patients have better disease control.[91] CCA has commenced a project to increase Consumer Education and Awareness in IBD (CEA-IBD).

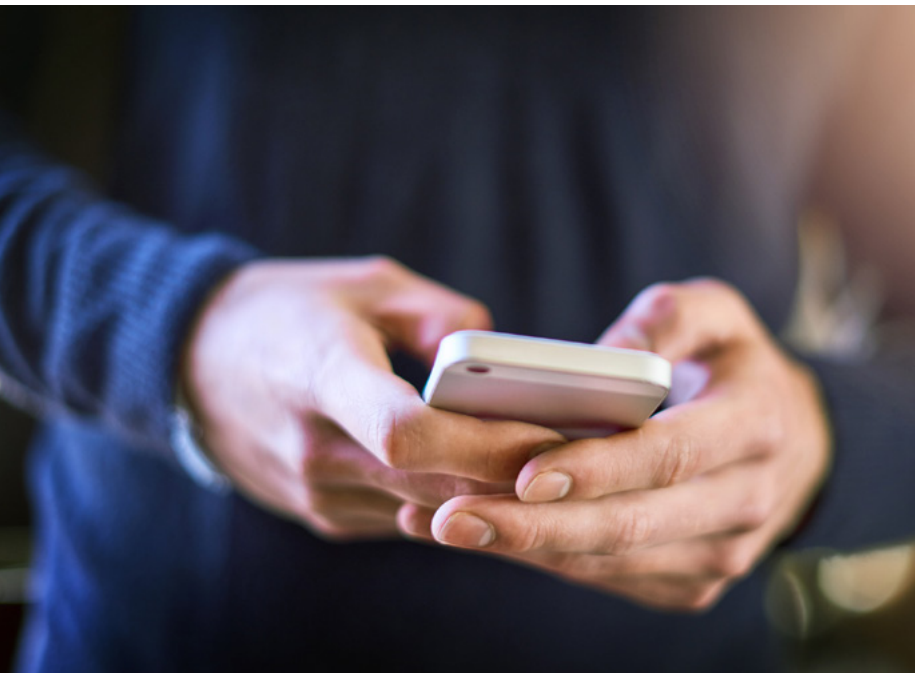
"For physician visits, we should offer the option of teleconference to selected patients with IBD, but the choice should really depend on the patient and physician preference physician criterion."

Prof Julian Pánes, Professor of Medicine and the former Chief of the Department of Gastroenterology at Hospital Clinic de Barcelona, Spain

Through the Optimising Health Literacy and Access (Ophelia) process, CEA-IBD plans to co-create and deliver culturally relevant and robust educational materials for people with IBD and their carers.[92]

A growing emphasis is on reducing the disease and treatment burden on patients. Moving from intravenous to subcutaneously administered biological therapies in selected patients has facilitated home-based management, lowering the disease burden on patients, and potentially decreasing the economic burden on healthcare systems.[93] The use of remote monitoring apps has empowered patients to monitor their own disease between clinic visits and seek medical care early in the event of disease flares. In addition, various apps also provide educational material about IBD, information on the location of public restrooms, emotional support for patients and community-building opportunities.[94]

Telemedicine has gained significant momentum during the pandemic. A 2022 systematic review compared the impact of telemedicine with that of standard care on the management of IBD.[95] The review included 17 randomised controlled trials encompassing 2,571 participants and reported that the telemedicine group had a higher positive impact on IBD-specific quality of life than the standard care group. Interestingly, the review noted that adolescents in the telemedicine group had a higher IBD-specific quality of life impact than those in the standard care group, while there was no significant difference between adults in each group in terms of IBD-specific quality of life. However, the intervention decreased the number of clinic visits among both adult and adolescent patients with IBD, highlighting the potential of telemedicine to reduce some of IBD-related burden experienced at a health system level. "For physician visits, we should offer the option of teleconference to selected patients with IBD, but the choice should really depend on the patient and physician preference and physician criterion," recommends Prof Pánes.



In 2016, Crohn's and Colitis Canada launched a programme called Promoting Access to Care through Centers of Excellence (PACE).[96] Through this programme, telemedicine services were established to serve remote communities, mobile apps were introduced to facilitate patient education and disease monitoring, clinical care pathways were designed to reduce steroid use, and the IBD Global Rating Scale (GRS) was developed to facilitate patient-centric care.[97] Patient care is evaluated in the GRS based on clinical quality and the quality of patient experience. Clinical quality is assessed by the provision of a patient information sheet, the performance of regular patient surveys, the appropriateness of investigations and treatment, the quality of disease management, the extent of communication between physicians and patients, and physician focus on overall patient well-being. Patient experience is evaluated based on access to care, ease of booking a clinic visit, timeliness of care and ability to provide feedback. The incorporation of patient feedback into care assessments is vital to improving patient-centric care in the long term.

Improving access to novel agents

Improving access to novel agents requires global efforts to streamline and expedite regulatory and reimbursement procedures for innovative therapies. The Institute for Advanced Clinical Trials for Children (I-ACT) and the Collaborative Network for European Clinical Trials for Children (conect4children; c4c) are working together to develop an international multi-stakeholder approach to accelerate access to new therapies for children with IBD.[98] The administrative burden, such as requiring prior approvals for biologic therapy, should also be minimised to ensure timely access to patients.

The use of biosimilars has the potential to lower drug costs, improve accessibility and expand resources available to fund emerging novel therapies. Various anti-TNF biosimilars have been approved across the US and Europe.[99,100] Since 2019, certain provinces in Canada have mandated a switch from the originator to a biosimilar compound for patients receiving anti-TNF therapy with public coverage. A survey of 40 patients with IBD who were switched from an originator to a biosimilar compound was performed in Alberta and British Columbia between 2019 and 2020. Over half of the patients in the survey did not feel confident about the management of their condition with biosimilars. About 12% of patients stated that they did not receive additional communication from their providers regarding this switch. Most patients expressed the desire to have more control over their choices for treatment.[101] Enabling good communication to ensure patient understanding of the risks, benefits and unknowns, as well as arranging closer follow-up, are essential before switching to biosimilar therapy. Caution should be exercised around non-medical substitution and a one-size-fits-all approach.[102] Reinvesting savings from using biosimilars in IBD care through ring-fenced funding mechanisms will facilitate innovation in this space.

Accelerating research in IBD

Unravelling the multifactorial origins of IBD

"Understanding the actual cause of IBD and how it can be prevented in the first place, that really has to be the focus of our research," emphasises Prof Jairath. However, the path to this goal is long and complex, given the multifactorial origins of IBD.

Predicting the risk of development of IBD among individuals in the general population is challenging given the lower incidence of the disease and the long follow-up duration needed.[103] However, studies have looked at risk factors for developing IBD among first-degree relatives (FDR) of patients with the disease. The Genetics, Environmental, Microbial (GEM) project evaluating 6 to 35 year old FDR of patients with CD identified elevated faecal calprotectin as a risk factor for the future development of CD.[104] However, no biomarkers have been adequately validated to predict disease development. Therefore, most advice to reduce disease risk, especially in FDR of patients, relies on reducing environmental exposures.

"Patients with IBD are less likely to have children than non-IBD patients, not because they are less fertile but because they are worried about passing it on to their children."

Dr. Johan Burisch, Gastroenterologist at the Copenhagen Center for Inflammatory Bowel Disease in Children, Adolescents and Adults at Hvidovre Hospital, Hvidovre, Denmark

"Patients with IBD are less likely to have children than non-IBD patients, not because they are less fertile but because they are worried about passing it on to their children, even though we know the risk of transmission is not high," says Dr Burisch. It is crucial to develop methods to predict the risk of IBD transmission, mitigate this risk and improve the quality of life for patients with IBD.

Given that genetic factors increase disease susceptibility but do not predict disease occurrence with certainty, genetic testing remains an investigational tool in assessing disease risk.[105] Studies are now looking at how very early environmental exposures and microbiome changes may impact the development of IBD in genetically predisposed individuals. MECONIUM is a global multicentre study evaluating pregnant women with and without IBD. The combined effect of genetic factors, disease activity and treatment regimens in the mother with breastfeeding and antibiotic use in their children on the risk of development of IBD is being investigated. The study looks to identify microbes in the gut of the mother that can be manipulated to reduce risk of IBD in the offspring.[106]

Supporting innovations in treatment and monitoring

Continued innovation is necessary to improve outcomes in patients with IBD. New approaches to optimising existing therapies are leveraging our understanding of how genetic, microbial, clinical, immunological, and pharmacokinetic factors impact drug response. Multiparametric predictive models incorporating these facets are likely to have the best predictive capacity.[107-109] Research is ongoing in artificial intelligence (AI)-based multi-omics analysis to facilitate precision medicine for IBD.[110] Investment should simultaneously be made in the development of more potent therapies that improve the rates of remission and mucosal healing.

Monitoring patients on therapy with invasive procedures remains a deterrent to T2T approaches. Video capsule endoscopy (VCE) is a non-invasive tool that can be especially helpful to assess small bowel lesions in CD. Coupled with AI and computer-assisted diagnostic systems to evaluate the mucosal findings, VCE has the potential to replace invasive methods to assess disease remission. This may improve patient acceptability of T2T approaches.[108]

Conclusion and calls to action

IBD are chronic disabling conditions affecting individuals in the peak of their productive adult life. While associated with low mortality, they are a major cause of chronic morbidity and disability, significantly impacting patients' quality of life. Increasing incidence in newly industrialised nations, rising prevalence in high-income countries and an ageing population contribute to a mounting global disease burden.

Diagnostic delays are common due to a lack of patient and physician awareness as well as bottlenecks in specialist referrals for diagnostic endoscopies and biopsies. The advent of biologic therapies and oral small molecules has transformed the landscape of IBD treatment with significant improvements in clinical and mucosal remission of disease. However, only 20-30% of patients on novel agents have a sustained response after one year of treatment and predictors of a lack of sustained response remain unclear.

There is a strong need for multidisciplinary care for these patients, encompassing domains of nursing, nutrition and psychosocial support; resource constraints are often impediments to accessing this care. Patient-centricity is key to improving the acceptability and outcomes of treatment. The incorporation of technology has helped make headway in this space, but much more remains to be done.

Streamlining the IBD care pathway to reduce health system burden

Improving awareness among patients and frontline physicians, especially in countries in the emergence and accelerating incidence phase, is crucial in facilitating early diagnosis and treatment for IBD. Diagnosis of IBD requires specialist evaluation, endoscopy and biopsy. Since abdominal symptoms of pain and diarrhoea are quite common, the Australian example should be followed in using faecal calprotectin, a non-invasive test, to rule out IBD in selected patients. This will reduce wait times for specialist evaluations and prioritise patients in need. In addition, the financial burden on patients in remote areas seeking diagnostic tests will be mitigated.

Patients should be monitored closely while on treatment with emphasis on early management of disease flares.

Therapeutic decision-making should take into consideration the STRIDE-II criteria, which emphasise the goals of clinical, biochemical and endoscopic remission towards improved long-term outcomes and reduced risk of surgery. Patients should be monitored closely while on treatment with emphasis on early management of disease flares. The use of point-of-care faecal calprotectin tests can facilitate monitoring for flares in the home setting. The engagement of a multidisciplinary care team is of paramount importance. Training and employment of specialist IBD nurses in multidisciplinary teams should be prioritised with the option of integrating nursing services across different inflammatory diseases. Due attention should be paid to the nutritional and mental health support of patients. For paediatric patients, transitional care to adult physicians should be managed holistically.

Expanding the use of digital technologies to improve patient-centric care

The use of mobile applications has revolutionised the management of chronic diseases. Through these apps, educational materials on IBD can be disseminated to improve patient knowledge of the disease and treatment options. Patients can use the apps to record their disease symptoms to facilitate early identification of flares. Resources must be allocated towards surmounting technological, logistical and medico-legal constraints in integrating data from these apps into electronic health records. Use of telemedicine for follow-ups must be considered based on physician and patient preference. This would lower the overall disease burden for young adults with work and social commitments, and simultaneously decrease the health system burden.

Investing in research for therapy and monitoring

Significant progress has been made in developing novel therapies for IBD, but more ground needs to be covered. Investment should be directed towards developing predictive models to identify patients who will benefit from specific novel agents. Such personalised therapy may help to reduce the need for multiple drug switches before identifying optimal therapy, expedite disease control, and improve outcomes while lowering overall costs. The development of non-invasive modalities for monitoring mucosal healing while on treatment is crucial to improving patients' acceptance of T2T strategies. Developing new drugs with better mucosal response and an acceptable side effect profile should be prioritised.

Improving the quality of life of patients, families and caregivers

At the centre of this chronic disabling illness are patients and their loved ones suffering huge impacts on their quality of life and mental health. There is a great need for multidisciplinary integrated care in the bio-psycho-social model. Simple measures such as a "Can't Wait Card" to access washrooms in public settings can go a long way in facilitating the social activities of patients.[111] Improved communication with patients around reproductive concerns may serve to allay anxiety around transmitting the illness to their offspring.

Offering IBD accommodations in school can enhance students' learning experience and test-taking ability.[112] Support for caregivers from healthcare professionals and through social networking should be more forthcoming.

The pandemic has highlighted significant health system challenges for patients with IBD and other chronic diseases in receiving timely care. With this multifaceted approach to targeting IBD, patient outcomes will improve alongside the overall capacity building of the health system. Eventually, this will result in reduced wait times, better access to care and improved disease control for IBD patients. Over time, the efforts in the IBD space can be expanded to other chronic inflammatory diseases to provide integrated solutions across different domains.

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