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Characteristics of non-respondents to self-reported questionnaires in a large inflammatory bowel disease cohort

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CONFLICTS OF INTEREST

None declared.

ABSTRACT

Background: A major threat to the validity of longitudinal cohort studies is non-response to follow-up, which can lead to erroneous conclusions. The profile of chronic diseases non-respondents is therefore important, but has rarely been assessed. The objective of this study was to evaluate the number and profile of non-respondents to the self-reported questionnaires among patients included in the Swiss Inflammatory Bowel Disease Cohort (SIBDC).

Methods: In this study, we included all patients enrolled between 1st November 2006 and 30th June 2011. Patients who returned the questionnaires and those who did not were compared using age, sex, and various disease and socio-demographic characteristics.

Results: Among 1945 IBD patients who received the inclusion questionnaire 340 (17.2%) did not respond (18.8% CD, 15.6% UC). Risks factors of non-response for patients with CD were: older age, male gender, shorter disease duration and complicated disease behaviour, whereas only shorter disease duration was significant for UC patients. Out of 1605 patients who received the first follow-up patient questionnaire 323 (24%) did not respond (26% CD, 21.4% UC). The CD non-respondents had lower level of education, ileal disease location, lower number of surgery and use of immunomodulators or biologicals and lower IBDQ while UC non-respondents were single, had active disease, less resection surgery and not currently receiving immunomodulator or biological therapies.

Conclusions: In conclusion, assessing non-respondents' characteristics are necessary to develop strategies to minimize non-response in future studies.

KEYWORDS

Crohn’s disease, ulcerative colitis, non-respondent, self-administrated questionnaires, bias, epidemiological study

INTRODUCTION

Inflammatory bowel disease (IBD) includes Crohn's disease (CD) and ulcerative colitis (UC). These are chronic inflammatory diseases of the gastrointestinal tract of unknown aetiology characterized by alternating periods of remission and relapse. Often diagnosed in adolescence, these diseases have considerable impact on patients' daily life including recurrent physical symptoms, psychosomatic distress and poorer social and professional functioning[1, 2]. IBD is considered as a disease of industrialized nations, and is rising in societies with increasing western life-styles[3-5]. The incidence of IBD has stabilised since the end of the 20th century in high-incidence areas but prevalence is still increasing, due to the longer life expectancy of patients with these diseases[3-5]. Many countries have now started cohort studies involving IBD patients to observe disease course and its burden over time and to get up-to-date epidemiological data[3, 4, 6].

A major threat to the validity of longitudinal cohort studies is non-response to follow-up, which can lead to erroneous conclusions. Follow-up non-response is however inevitable and the scope to which it could bias study results is of major concern[7-9]. Attrition rates in epidemiologic studies have increased significantly over the past 30 years[10]. Among factors related to non-participation over time is the increasing rate of men and women having full-time employment and thus less time for study participation and complex survey instruments involving medical assessments, biologic sampling, and repetitive requests for follow-up that are sometimes burdensome for participants[10-12]. Data on participation rates are rarely discussed in cohort studies of IBD. In the Manitoba Cohort Study an attrition rate of 9% was reported after two years of follow-up[13]. In studies of other chronic inflammatory disease like rheumatoid arthritis[14], the non-response rate to the first study questionnaire was as high as 31%. Health surveys in Europe usually reported a 10-30% non-response rate[13, 15].

The Swiss IBD Cohort Study (SIBDCS) started in 2006 with the objective to provide up-to-date epidemiological data and to investigate risk factors associated with the course of the disease[16]. This cohort includes prevalent and incident IBD patients, with a yearly follow-up. The goal of the

present study is to document socio-demographic, clinical and/or psychosocial factors associated with non-response to patient initial and first follow-up self-reported questionnaires to define profiles of non-respondents to be taken into account in further studies performed with those cohort data.

MATERIALS AND METHODS

Study design and population

We used data from the Swiss IBD Cohort, which started on 1st November 2006. Participants were recruited through their gastroenterologist. A requirement for inclusion was residing permanently in Switzerland or having contracted Swiss health insurance and being treated on a regular basis in Switzerland. Diagnosis had to be established at least 4 months prior to inclusion or after at least one recurrence of the symptoms. Diagnosis was assessed using Lennard-Jones criteria, and was confirmed by radiological, endoscopic and histological findings. In this study, we included all patients enrolled between 1st November 2006 and 30th June 2011, at which time all of them received at least 2 reminders to complete their first follow-up self-administrated questionnaire, i.e., by the end of June 2013. We excluded paediatric patients and those with indeterminate colitis.

Data collection and management

Following a screening procedure, to confirm that patients met the inclusion criteria and provided informed consent, patients were enrolled by the gastroenterologist who then completed an initial medical questionnaire (IMQ). Patients were subsequently invited to complete an initial patient questionnaire (IPQ). After one year, patients had an annual medical examination with their treating gastroenterologist to update their medical record. During the visit the physician / study nurse completed a follow-up medical questionnaire (FMQ). In addition, an annual follow-up patient questionnaire (FPQ) was sent to the patient to update the psychosocial, habits and health resource consumption evolution. Non-respondents to IPQ and FPQ were sent a first reminder 3 months after the first sending, followed by a second one at 12 months. We preformed two analysis, one investigating responses to IPQ and the other responses to FPQ. Patients selected for each analysis are described in the Figure 1. It is important to take account to the fact that patients who completed FPQ are an extract of those who already completed IPQ. If a patient did not complete IPQ, he never received FPQ.

Outcome and exposures

We considered two outcomes: the first was non-response to the IPQ and the second was non-response to the FPQ. Risk factors that were taken into account were: age, sex, age at diagnosis, disease duration, history of surgery (none, resection surgery, surgery for fistula or abscess, other abdominal surgery) and current therapies (none, 5-ASA compounds, systemic steroids, immunomodulators, biological). Therapies and surgeries were considered as binary variables, not unordered categorical because one patient could have had multiple therapies or surgeries. For patients affected by CD, we considered disease location (ileal, colonic, ileocolonic, upper gastrointestinal involvement) and severity (Crohn's disease activity index - CDAI) as measured during the medical visits. This latter variable was considered as categorical with categories: active (CDAI>=150) and remission (CDAI<150). Disease behaviour was based on Montreal classification (non stricturing non penetrating, stricturing, penetrating, perianal disease modifier). For patients with UC, we considered disease location (proctitis, left-sided colitis, pancolitis) and severity (Modified Truelove and Witts activity index (MTWAI)) with 2 categories: active (MTWAI>=3) and remission (MTWAI<3). These variables were based on data from the IMQ for the primary analysis and from the IMQ or FMQ for the secondary analysis. Socio-demographic variables were marital status (married versus single), educational level (none or compulsory education, upper secondary education, tertiary education) and social support as assessed by the ENRICHD Social Support Inventory Scale, which is a 7-item score that measures emotional, practical and informational support. Quality of life (Qol) was evaluated through the SF36 questionnaire, which assessed 8 health domains (Physical Functioning, Physical Role, Emotional Role, Vitality, Mental Health, Social Functioning, Bodily Pain, General Health Perception) that contribute each in a different proportion to the scoring of the Physical Component Summary and the Mental Component Summary and the Inflammatory Bowel Diseases Questionnaire (IBDQ) (32 items, 4 sub-scores: bowel symptoms, systemic symptoms, emotional function and social function). Mood was assessed with the Hospital Anxiety and Depression Scale (HADS) divided in 2 sub-scales, one assessing

depression and the other anxiety. A score of 0 to 7 is considered normal, 8 to 10 mild, 11 to 14 moderate and 15 to 21 severe anxiety or depression.

Clinical variables considered for each patient were those referring to the closest medical visit, i.e. for the analysis of patients non-respondent to IPQ we consider clinical variables collected in the IMQ; for the analysis of patients non-respondent to FPQ we used data from the last medical questionnaire available and preceding the FPQ: FMQ or IMQ.

Statistical analysis

Descriptive statistics were conducted to compare baseline characteristics of respondent vs. non-respondent to the IPQ and respondent vs. non-respondent to the FPQ; in both groups, two-sample t-tests were used to compare means of normally distributed variables or Wilcoxon rank-sum test to compare distribution of non-normally distributed variables. Chi-square tests were used to test the null hypothesis of no association between groups for categorical and binary variables.

To explore risk factors explaining no-response to questionnaires, we first performed univariate logistic regression. Multivariate logistic regression was performed first with all covariates with a univariate p-value < 0.2, removing insignificant covariates, and then adding remaining covariates one by one, checking the model significance and consistency at each step. For the purposes of this study, a p-value of < 0.05 was considered statistically significant. We performed separate analyses for CD and UC because disease phenotypes are not comparable. All analyses were performed on the set of data without missing values. Statistical analyses were conducted using Stata Version 12 (StataCorp LP, College Station, TX, USA).

RESULTS

Responders and non-responders to IPQ

On the 30th of June 2011 a total of 1979 patients were included in the SIBDC; 34 of those contained a missing value and where excluded from analyses. Among the 1945 patients included in the first analysis, figure 1, 1130 had CD (58%) and 815 had UC (41%). Non-responders were slightly more frequent in CD (N=213, 18.8%), table 1, than in UC (N=127, 15.6%), table 2. Younger CD patients tend to respond less than older patients (37 vs. 42 years old; $p<0.001$). The proportion of females who responded to IPQ was higher than males ($p<0.05$) for CD, whereas no difference was observed among patients with UC. For both CD and UC patients, non-responders had a shorter disease duration (6 vs. 9 years for CD, $p<0.001$; 6 vs. 7 years for UC, $p<0.05$). CD disease behaviour was associated with response to IPQ, indeed non-responders more frequently had a complicated disease presentation (with stenosis, fistula) than responders. Non-responders with CD had a higher proportion of perianal involvement than responders (18.0% vs. 29.1%; $p<0.001$). No association between disease activity and response to IPQ was observed and around two-third of patients with CD or UC were in remission at enrolment. There were no statistical differences about therapies for CD neither for UC, but it is interesting to notice that nearly forty-five percent of CD patients received an immunomodulator and one quarter a biological therapy at the time of inclusion and two-thirds of UC patients were receiving 5-ASA.

Predictors of non-response to IPQ

We performed multivariate regression to find the most appropriate set of independent risk factors for being non-respondent to IPQ, table 3. After adjustment, we found that CD and UC profiles for being non-respondent to IPQ was different. The odds of having a longer disease duration is 1.03 times greater for responders as compared to non-responders, in CD ($p=0.003$) and in UC ($p=0.014$). In CD only, being a female (OR=1.48; 95%CI: 1.09-2.02) and having a higher age at inclusion (OR=1.01; $p=0.011$) are independent factors for being a responder to IPQ. On the opposite, having a stricturing vs. penetrating disease behaviour decreased the odds of being responder to IPQ by

approximately 40% vs. 60%.

Responders and non-responders to FPQ

Among the 1945 patients included in the first analysis, 1605 responded to the IPQ. To be able to perform univariate and multivariate analyses of response to FPQ on the same sample of patients, we selected patients for whom variables used for analyses were not missing. The total number of patients that were thus selected was 1346, figure 1, 771 with CD and 575 with UC. Nearly one quarter of CD patients (N=200), and one fifth of UC patients (N=123) did not respond to FPQ. The proportion of female non-responders to FPQ was not significantly different from responders to FPQ; however they were more frequent than non-responders to IPQ (60.5% vs. 45.5%), table 1. CD non-responders were younger (38 vs.42 years old; $p<0.05$) and had a shorter disease duration (6 vs. 9 years; $p<0.05$). The proportion of CD patients with active disease was higher among non-responders to FPQ (69.5% vs. 78.5%; $p<0.05$). As observed in the first analysis, patients with more complicated disease behaviour, or a perianal involvement were also more frequently non-respondent to FPQ. Non-responders had less previous resection surgery than responders, in CD (32.5% vs. 41.2%; $p<0.05$) or in UC (2.4% vs. 8.6%, $p<0.05$). In overall, patients who did not reply to FPQ were less frequently receiving a drug treatment; not being under biological therapy in CD or immunomodulator therapy in UC was significantly associated with non-response to FPQ.

The proportion of patients being married was significantly lower in non-responders (34.5% for CD, 46.3%), table 3, compared to responders. Lower education level was associated with non-response to FPQ, but only in CD. Patients who did not respond to FPQ had a lower positive social support than responders. Around 10% more non-responders CD patients had mild to severe depression, as well as significantly lower mental health SF-36 components scales and IBDQ scores. No other psychosocial factors differed between responders and non-responders in UC.

Predictors of non-response to FPQ

We performed multivariate regression to find independent risk factors for being non-respondent to

FPQ, table 5. We found a completely different profile for being non-respondent to FPQ among CD and UC. The odds of having a longer disease duration is 1.03 times greater for responders as compared to non-responders, in CD only (p=0.003) but not in UC. In CD having a disease located in the upper GI or the colon, a history of resection surgery (OR=1.64; 95%CI: 1.05-2.55) or surgery for fistula (OR=2.09; 95%CI: 1.21-3.61), being under immunomodulator (OR=1.69; p=0.004) or biological therapy (OR=2.18; p<0.001) remained independent factors for being a responder to FPQ. Risk factors associated to both of these treatments were also observed for UC. On the opposite, having a stricturing vs. penetrating disease behaviour decreased the odds of being responder to FPQ by approximately 60% vs. 70%. Patients with at least upper 2^{nd} education were significantly more responders to FPQ. Other independent risk factors for being responder to FPQ in UC were non-active disease, history of surgery and marital status (OR=1.85; p=0.004).

DISCUSSION

This paper reports a detailed analysis of risk factors associated with non-response to IPQ and FPQ in the Swiss IBD Cohort Study. The results show differences between respondents and non-respondents and between IPQ and FPQ respondents and different profiles according to diagnostic. Age, female gender, disease duration and non-complicated disease behaviour were independent risk factors for response to IPQ among patients with CD, whereas education, disease location, history of surgery and current use of immunosuppressants or biologicals and higher IBDQ were additional risk factors for response of CD to FPQ. UC patients with longer disease duration were at higher risk of response to IPQ, and married UC patients, in remission, having had resection surgery, and currently receiving immunomodulator or biological therapy were at higher risk of response to FPQ.

Prior studies have found that follow-up responders tend to differ from non-responders in their sociodemographic and health characteristics. Short disease duration, young age and male gender have already been found as risks factors of non-response in some studies. We can make the assumption that patients not having a long standing illness are younger and young age implies higher risks behaviours, increased individualism and lower willingness to follow authority especially among young men[7, 11, 15, 17]. Furthermore, if the disease is relatively new, maybe the impact to the life of the patient is not perceived as hard as if it was present and impeding for years. Indeed, when the study investigate a particular symptom or condition that someone has, he could feel deeper involved and be more likely to participate in. [11, 14, 15]. However, it is interesting to notice that the difference in term of disease duration is not very high. It would be useful to stratify non-response with various categories of disease duration (1-2 years vs 2-5 vs 5-10…) to see if it has a connexion with the stages of accepting the illness. Indeed, this small difference could be explained by the denial and isolation phase that characterise the beginning of the disease and could no longer be present after a few years.

Concerning disease characteristics, our findings match with studies reporting higher morbidity and

health care utilization among respondents. Again, the relevance of the study to the life of participants provides special motivation for participation[11][14], [15], [18]. For patients with CD, it is reported that non-respondents have their lesions located more in the ileal part of the bowel. Prior studies did not search for such a connection between nonresponse and disease location, or did not find one[19]. However, Vind et al. mention that older patients had more colonic location, younger patients had more ileal location and ileal location has more structuring and penetrating behaviour[3], which could fit with our results wherein non-responders have shorter disease duration, more complicated behaviour and ileal location.

The socio-demographic characteristics of non-responders in the SIBDCS are consistent with previous studies saying that patients with lower education level, mood disorders, greater levels of psychological and disease-related difficulties, lower SF-36, being unmarried, less socially active, having reduced physical function, mental health and less positive health-related behaviours are associated with greater level of non-response[2], [7], [13], [17], [18], [20], [21]. It has been demonstrated in patients with ischemic heart disease that lack of social support is associated with increasing morbidity[22]. It has been demonstrated [23] that higher social support in IBD patients enhance positive thoughts and increase the faculty to face and deal with stress and life difficulties. These results imply that patients who are the most in need of psychological and social help may not be reached. Future researchers have to increase effort and resources into encouraging participation for patients with these characteristics in order to reduce non-response and assist the most vulnerable patients.

The strengths of this study include the large sample size, the sample selection technique that allow a great diversity of patients (geographically and demographically), the use of not only traditional socio-demographic characteristics but also medical treatment, disease extent and clinical characteristics, diversity of data collection means (medical visits and patients questionnaires) and the use of validated indices.

There are several limitations that should be considered when interpreting our results. First, we

treated all non-respondents as a homogeneous group and did not differentiate whether patients did not respond due to refusal or inability to be contacted. Second, in the secondary analysis we have more medical information over time about respondents as they have had more medical visits so it can create false differences because of the information gap. Third, in the second analysis, we do not include the IPQ non-responders and it could potentially bias the results.

In conclusion, we found that young age, male gender, short disease duration, few therapies or surgeries, severe disease, low quality of life and not being married can be risks factors for non-response. One hypothesis could be that patients with less social support live their disease more heavily and are less encouraged to fight against it, which results in lower quality of life, less medical monitoring or compliance and therefore more severe disease. Assessing non-respondents' characteristics is necessary to develop strategies to minimize non-response in future studies (increase financial insensitive, increase number and methods of contacts…). Great efforts need to be made to motivate response from all patients (with a certain type of disease, with severe or less severe disease, with more or less health care utilization,...) to have the most representative sample possible so non-response does not affect the validity of study results.

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STATEMENT OF AUTHORSHIP:

Study design and conception (xx), statistical analysis (xx), analysis and interpretation (xx), drafting the article or revising it critically for important intellectual content (xx), final reading and approval of the manuscript (xx).

TABLES AND FIGURES

Figure 1: flow chart for the selection of patients included in the two analyses performed: (A) respondent to initial patient questionnaires (IPQ); (B): respondents to follow-up questionnaires (FPQ).

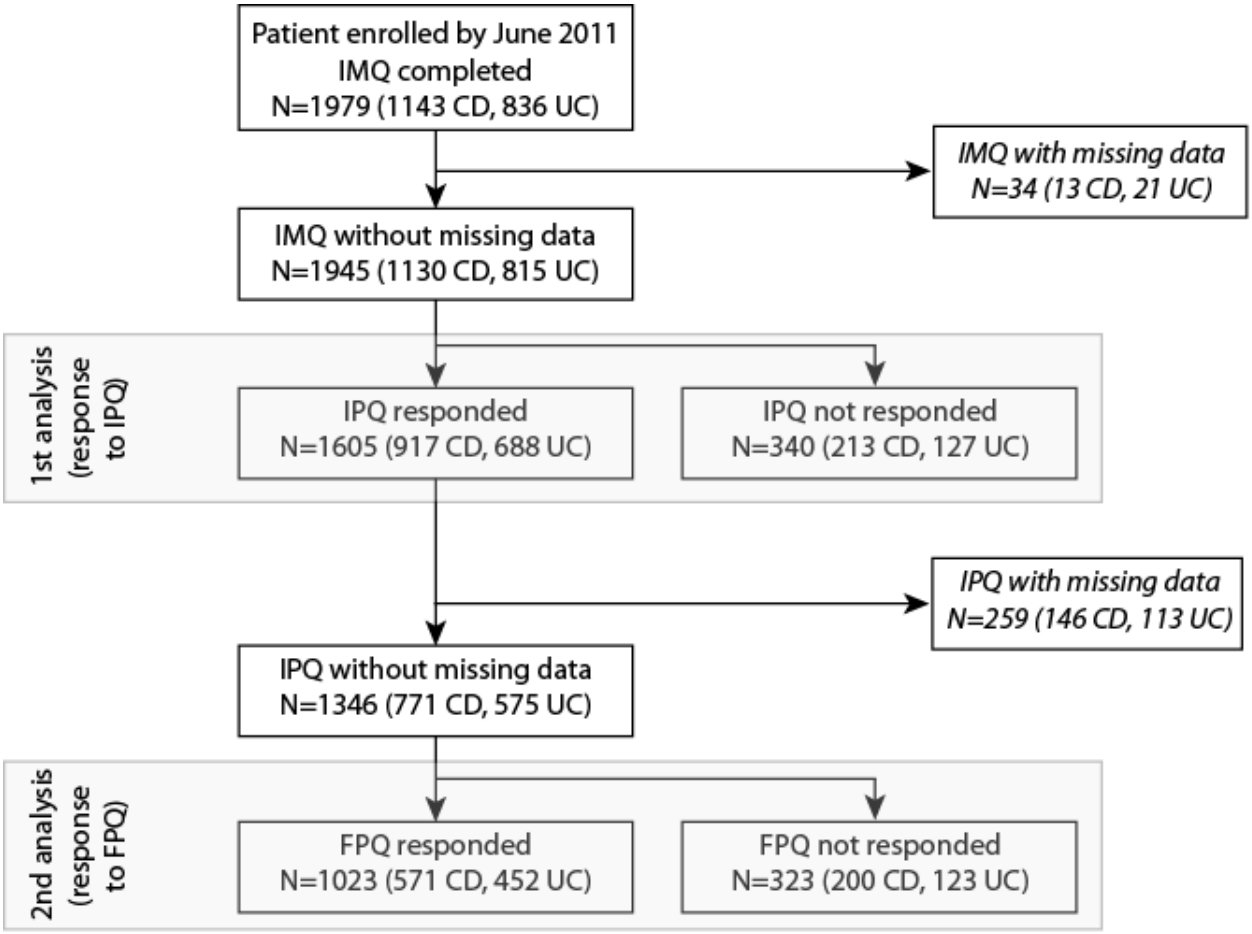

Table 1: clinical characteristics of CD patients at enrolment visit and at the first follow-up visit. Values are numbers and percentages unless stated otherwise.

Variable	**Enrolment (N=1130)**	**Follow-up (N=771)**		
Variable	**Responders N=917 (81.2)**	**Non-responders N=213 (18.8)**	**Responders N=571 (74.0)**	**Non-responders N=200 (26.0)**
Age (years)[$]	42 (15)	37 (14)**	42 (14)	38 (15)*
Female Gender	501 (54.6)	97 (45.5)*	315 (55.2)	121 (60.5)
Age at diagnosis (years) [£]	26 (17)	25 (16)	26 (17)	25 (17.5)
Disease duration (years) [£]	9 (14)	6 (10)**	9 (14)	6 (11 *
Disease activity				*
Remission (CDAI < 150)	584(63.7)	137 (64.3)	448 (78.5)	139 (69.5)
Active (CDAI $\geq$ 150)	333 (36.3)	76 (35.7)	123 (21.5)	61 (30.5)
Disease location				*
Ileal only	276 (30.1)	61 (28.6)	148 (25.9)	66 (33.0)
Colonic	346 (37.7)	81 (38.0)	231 (40.5)	57 (28.2)
Ileocolonic	285 (31.1)	70 (32.9)	158 (27.7)	67 (33.5)
Upper GI involvement only	10 (1.1)	1 (0.5)	34 (6.0)	10 (5.0)
Behaviour		**		**
Non stricturing, non penetrating	647 (70.6)	121 (56.8)	430 (75.3)	119 (59.5)
Stricturing	159 (17.3)	43 (20.2)	84 (14.7)	47 (23.5)
Penetrating	111 (12.1)	49 (23.0)	57 (10.0)	34 (17.0)
Perianal involvement	1665 (18.0)	62 (29.1)**	79 (13.8)	58 (29.0)**
History of surgery				
None	429 (46.8)	112 (52.6)	257 (45.0)	99 (49.5)
Previous resection surgery	353 (38.5)	69 (32.4)	235 (41.2)	65 (32.5)*
Previous surgery for fistula or abscess	197 (21.5)	45 (21.1)	135 (23.6)	38 (19.0)
Current therapy				
None	107 (11.7)	23 (10.8)	48 (8.4)	23 (11.5)
5-ASA compounds	171 (18.7)	31 (14.5)	116 (20.3)	37 (18.5)
Systemic steroids	178 (19.4)	50 (23.5)	127 (22.2)	43 (21.5)
Immunomodulators	431 (47.0)	96 (45.1)	307 (53.8)	93 (46.5)
Biological therapy	227 (24.7)	63 (29.6)	191 (33.4)	51 (25.5)*

[$]mean (SD); [£]median (IQR); **p<0.001; *p<0.05; indication of p-values for chi2 testing between categorical variables are put in the corresponding subheading line

Table 2: clinical characteristics of UC patients at enrolment visit and at the first follow-up visit. Values are numbers and percentages unless stated otherwise.

Variable	**Enrolment (N=815)**	**Follow-up (N=575)**		
Variable	**Responders N=688 (84.4)**	**Non-responders N=127 (15.6)**	**Responders N=452 (78.6)**	**Non-responders N=123 (21.4)**
Age (years)[$]	43 (15)	41 (13)	43 (14)	41 (14)
Female Gender	372 (45.6)	266 (46.3)	215 (47.6)	51 (41.5)
Age at diagnosis (years) [£]	31 (17)	32 (16)	31 (17)	30 (16)
Disease duration (years) [£]	7 (12)	6 (10)*	7 (12)	5 (12)
Disease activity				
Remission (MTWAI $\leq$ 3)	455 (66.1)	76 (59.8)	330 (73.0)	80 (65.0)
Active (MTWAI > 3)	233 (33.9)	51 (40.2)	122 (27.0)	43 (35.0)
Disease location				
Proctitis	110 (16.0)	14 (11.0)	78 (17.3)	22 (17.9)
Left-sided colitis	292 (42.4)	53 (41.7)	194 (42.9)	50 (40.7)
Pancolitis	286 (41.6)	60 (47.2)	180 (39.8)	51 (41.5)
History of surgery				
None	612 (89.0)	113 (89.0)	392 (86.7)	110 (89.4)
Previous resection surgery	41 (6.0)	6 (4.7)	39 (8.6)	3 (2.4)*
Previous surgery for fistula or abscess	15 (2.2)	3 (2.2)	10 (2.2)	4 (3.2)
Current therapy				
None	75 (9.4)	10 (7.9)	34 (7.5)	13 (10.6)
5-ASA compounds	422 (61.3)	82 (64.6)	300 (66.4)	80 (65.0)
Systemic +/- topic steroids	176 (25.6)	31 (24.4)	131 (29.0)	30 (24.4)
Immunomodulators	215 (31.2)	42 (33.1)	175 (38.7)	29 (23.6)*
Biological therapy	54 (7.8)	11 (8.7)	54 (11.9)	9 (7.3)

[$]mean (SD); [£]median (IQR); *p<0.05; indication of p-values for chi2 testing between categorical variables are put in the corresponding subheading line

Table 3: patient self-reported characteristics of CD and UC patients who replied to FPQ. Values are numbers and percentages unless stated otherwise.

Variable	CD		UC	
Variable	**Responders N=571**	**Non-responders N=200**	**Responders N=452**	**Non-responders N=123**
Married	265 (46.4)	69 (34.5)*	268 (59.3)	57 (46.3)*
Education level		*		
None or compulsory	57 (10.0)	37 (18.5)	43 (9.5)	14 (11.4)
Upper 2nd education	340 (59.5)	117 (58.5)	260 (57.5)	56 (45.5)
Tertiary education	174 (30.5)	46 (23.0)	149 (33.0)	53 (43.1)
Anxiety				
No anxiety	346 (60.6)	107 (53.5)	307 (67.9)	74 (60.2)
Mild	127 (22.2)	46 (23.0)	83 (18.4)	29 (23.6)
Moderate	77 (13.5)	36 (18.0)	48 (10.6)	14 (11.4)
Severe	21 (6.7)	11 (5.5)	14 (3.1)	6 (4.9)
Depression		*		
No depression	472 (82.7)	148 (74.0)	371 (82.1)	99 (80.5)
Mild	55 (9.6)	30 (15.0)	55 (12.2)	15 (12.2)
Moderate	39 (6.8)	18 (9.0)	21 (4.7)	6 (4.9)
Severe	5 (0.9)	4 (2.0)	5 (1.1)	3 (2.4)
Positive social support[$]	25.3 (5.3)	24.3 (6.0)*	25.8 (5.2)	24.3 (5.9)*
SF-36 Physical Functioning (PF)[$]	84.0 (20.6)	82.6 (20.3)	87.0 (18.8)	86.4 (18.6)
SF-36 Physical role (PR)[$]	68.3 (39.5)	64.1 (40.2)	70.3 (39.4)	73.6 (36.3)
SF-36 Emotional role (ER)[$]	73.9 (38.2)	66.8 (39.5)*	78.5 (34.9)	77.0 (35.2)
SF-36 Vitality (V)[$]	49.0 (21.8)	44.7 (23.4)*	50.0 (20.2)	51.1 (21.0)
SF-36 Mental Health (MH)[$]	65.0 (19.5)	60.8 (21.1)*	66.8 (18.0)	64.9 (20.4)
SF-36 Social Functioning (SF)[$]	72.6 (26.6)	66.3 (28.6)*	75.9 (25.7)	75.78 (23.7)
SF-36 Bodily Pain (BP)[$]	66.5 (27.4)	62.3 (28.4)	71.4 (26.4)	70.1 (26.5)
SF-36 General Health Perceptions (GHP)[$]	55.1 (22.5)	51.9 (22.5)	58.9 (20.9)	57.4 (21.3)
SF-36 Physical component summary (PS)[$]	46.7 (10.0)	46.0 (10.3)	48.2 (9.3)	48.4 (9.1)
SF-36 Mental component summary (MS)[$]	44.7 (11.6)	41.9 (12.2)*	45.7 (9.9)	45.1 (11.1)
IBDQ Bowel Symptoms score[$]	56.1 (10.1)	54.0 (11.0)*	57.0 (11.1)	56.1 (11.7)
IBDQ Emotional Function score[$]	24.2 (6.1)	22.7 (6.5)**	24.8 (5.9)	24.2 (6.2)
IBDQ Social Function score[$]	64.3 (12.7)	60.8 (13.9)*	65.2 (12.4)	64.0 (13.7)
IBDQ Systemic Symptoms score[$]	29.9 (6.2)	28.7 (7.0)*	30.0 (7.0)	30.7 (6.1)
IBDQ total score[$]	174.5 (31.1)	166.1 (34.6)*	177.1 (32.9)	175.0 (33.6)

[$]mean (SD); SF-36 values in the general population: PF: 82.5 (22.9); PR: 81.2 (33.8); ER: 81.3 (33.0); V: 61.0 (20.9); MH: 74.8 (18.0); SF: 83.6 (22.4); BP: 75.5 (23.6); GHP: 72.2 (20.2); PS and MS: 50 (19) ; *p<0.05; **p<0.001; indication of p-values for chi2 testing between categorical variables are put in the corresponding subheading line

Table 4: Multivariate analysis for risk factors associated to response to IPQ for patient with CD and UC

Variable	OR (95% CI) for response among CD	P-value	OR (95% CI) for response among UC	P-value
Female gender	1.48 (1.09-2.02)	0.011		
Age at inclusion	1.01 (1.00-1.02)	0.011		
Disease duration	1.03 (1.01-1.05)	0.003	1.03 (1.00-1.05)	0.014
Stricturing disease behaviour	0.61 (0.41-0.91)	0.017		
Penetrating disease behaviour	0.34 (0.22-0.51)	<0.001		

Table 5: Multivariate analysis for risk factors associated to response to FPQ for patient with CD and UC

Variable	OR (95% CI) for response among CD	P-value	OR (95% CI) for response among UC	P-value
Disease duration	1.03 (1.01-1.05)	0.003		
Active disease			0.57 (0.36-0.91)	0.019
Colonic only disease location	1.98 (1.26-3.11)	0.003		
Ileocolonic disease location	1.04 (0.66-1.63)	0.856		
Upper GI disease location	1.54 (0.67-3.55)	0.303		
Stricturing disease behaviour	0.41 (0.26-0.67)	<0.001		
Penetrating disease behaviour	0.30 (0.17-0.54)	<0.001		
Perianal involvement	0.27 (0.16-0.44)	<0.001		
History of resection surgery	1.64 (1.05-2.55)	0.028	5.54 (1.62-18.8)	0.006
History of Fistula/abscess surgery	2.09 (1.21-3.61)	0.008		
Current immunomodulator therapy	1.69 (1.17-2.43)	0.004	2.31 (1.44-3.70)	<0.001
Current biological therapy	2.18 (1.43-3.31)	<0.001	2.29 (1.06-4.95)	0.035
Marital status			1.85 (1.22-2.82)	0.004
Upper 2nd education	2.00 (1.20-3.33)	0.008		
Tertiary education	2.29 (1.28-4.07)	0.005		
IBDQ total	1.00 (1.00-1.01)	0.001		

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SUPPLEMENTARY TABLES

Table 1: Crude odds ratios (OR) and 95% confidence intervals (CI) for response to IPQ and FPQ according to clinical characteristics of CD patients.

Variable	OR (95% CI) for response to IPQ	P-value	OR (95% CI) for response to FPQ	P-value
Age	1.02 (1.01-1.03)	<0.001	1.01 (1.00-1.03)	0.011
Female Gender	1.44 (1.07-1.94)	0.017	0.80 (0.58-1.11)	0.191
Age at diagnosis	1.01 (1.00-1.02)	0.080	1.00 (0.99-1.01)	0.733
Disease duration	1.03 (1.01-1.05)	<0.001	1.03 (1.01-1.05)	0.001
Disease activity				
Remission (CDAI < 150)	1.00		1.00	
Active (CDAI $\geq$ 150)	1.03 (0.75-1.40)	0.862	0.62 (0.43-0.90)	0.011
Disease location				
Ileal only	1.00		1.00	
Colonic	0.94 (0.65-1.36)	0.759	1.81 (1.20-2.72)	0.005
Ileocolonic	0.90 (0.61-1.38)	0.587	1.05 (0.70-1.58)	0.809
Upper GI involvement only	2.21 (0.28-17.6)	0.454	1.52 (0.71-3.25)	0.285
Behaviour				
Non stricturing, non penetrating	1.00		1.00	
Stricturing	0.69 (0.47-1.02)	0.063	0.49 (0.33-0.74)	0.001
Penetrating	0.42 (0.29-0.62)	<0.001	0.46 (0.29-0.74)	0.001
Perianal involvement	0.53 (0.38-0.75)	<0.001	0.39 (0.27-0.58)	<0.001
History of surgery				
None	0.79 (0.59-1.07)	0.127	0.83 (0.60-1.15)	0.273
Previous resection surgery	1.31 (0.95-1.79)	0.098	1.45 (1.03-2.04)	0.031
Previous surgery for fistula or abscess	1.02 (0.71-1.47)	0.909	1.32 (0.88-1.97)	0.176
Current therapy				
None	1.09 (0.68-1.76)	0.720	0.71 (0.42-1.19)	0.195
5-ASA compounds	1.34 (0.89-2.04)	0.161	1.12 (0.74-1.69)	0.580
Systemic steroids	078 (0.55-1.21)	0.184	1.04 (0.71-1.54)	0.828
Immunomodulators	1.08 (0.80-1.46)	0.611	1.34 (0.97-1.85)	0.077
Biological therapy	0.78 (0.56-1.09)	0.147	1.47 (1.02-2.11)	0.038

Table 2: Crude odds ratios (OR) and 95% confidence intervals (CI) for response to IPQ and FPQ according to clinical characteristics of UC patients.

Variable	OR (95% CI) for response to IPQ	P-value	OR (95% CI) for response to FPQ	P-value
Age	1.01 (0.99-1.02)	0.140	1.01 (0.99-1.02)	0.176
Female Gender	1.35 (0.92-1.99)	0.123	1.28 (0.85-1.91)	0.229
Age at diagnosis	1.00 (0.98-1.01)	0.964	1.00 (0.99-1.02)	0.228
Disease duration	1.03 (1.00-1.05)	0.014	1.00 (0.97-1.02)	0.755
Disease activity				
Remission (MTWAI $\leq$ 3)	1.00		1.00	
Active (MTWAI > 3)	0.76 (0.51-1.12)	0.172	0.68 (0.44-1.05)	0.084
Disease location				
Proctitis	1.64 (0.88-3.07)	0.115	1.09 (0.70-1.70)	0.673
Left-sided colitis	1.15 (0.77-1.73)	0.482	1.00 (0.57-1.76)	0.987
Pancolitis	1.00		1.00	
History of surgery				
None	0.99 (0.54-1.8)	0.994	0.77 (0.40-1.45)	0.425
Previous resection surgery	1.27 (0.53-3.07)	0.584	3.77 (1.14-12.43)	0.029
Previous surgery for fistula or abscess	0.92 (0.26-3.22)	0.898	067 (0.20-2.18)	0.510
Current therapy				
None	1.22 (0.60-2.44)	0.574	0.68 (0.35-1.34)	0.276
5-ASA compounds	0.87 (0.58-1.29)	0.491	1.06 (0.69-1.61)	0.782
Systemic +/- topic steroids	1.06 (0.68-1.65)	0.780	1.26 (0.79-2.00)	0.315
Immunomodulators	0.91 (0.61-1.37)	0.685	2.04 (1.29-3.25)	0.002
Biological therapy	0.89 (0.45-1.76)	0.756	1.71 (0.82-3.58)	0.149

Table 3: Crude odds ratios (OR) and 95% confidence intervals (CI) for response to FPQ according to patient self-reported characteristics of CD and UC patients.

Variable	OR (95% CI) for response to FPQ among CD	P-value	OR (95% CI) for response to FPQ among UC	P-value
Education level				
None or compulsory	1.00		1.00	
Upper 2nd education	1.88 (1.85-3.00)	0.007	1.51 (0.77-2.95)	0.226
Tertiary education	2.45 (1.45-4.15)	0.001	0.91 (0.46-1.80)	0.799
Married	1.64 (1.17-2.29)	0.004	1.68 (1.12-2.51)	0.011
Anxiety				
No anxiety	1.00		1.00	
Mild	0.85 (0.57-1.27)	0.440	0.68 (0.42-1.12)	0.140
Moderate	0.66 (0.42-1.03)	0.073	0.82 (0.43-1.57)	0.564
Severe	0.59 (0.27-1.26)	0.175	0.56 (0.20-1.51)	0.254
Depression				
No depression	1.00		1.00	
Mild	0.57 (0.35-0.93)	0.024	0.97 (0.53-1.80)	0.944
Moderate	0.67 (0.37-1.22)	0.198	0.93 (0.36-2.37)	0.886
Severe	0.39 (0.10-1.47)	0.167	0.44 (0.10-1.89)	0.273
Positive social support[$]	1.03 (1.00-1.06)	0.029	1.04 (1.01-1.08)	0.011
SF-36 Physical Functioning[$]	1.07 (0.90-1.28)	0.416	1.03 (0.81-1.32)	0.755
SF-36 Physical role[$]	1.09 (0.95-1.25)	0.201	0.92 (0.77-1.10)	0.401
SF-36 Emotional role[$]	1.16 (1.01-1.33)	0.026	1.04 (0.86-1.25)	0.665
SF-36 Vitality[$]	1.19 (1.02-1.39)	0.019	0.94 (0.77-1.15)	0.590
SF-36 Mental Health[$]	1.20 (1.04-1.39)	0.010	1.10 (0.90-1.33)	0.324
SF-36 Social Functioning[$]	1.20 (1.05-1.37)	0.005	1.00 (0.84-1.19)	0.955
SF-36 Bodily Pain[$]	1.13 (0.99-1.30)	0.066	1.04 (0.87-1.24)	0.619
SF-36 General Health Perceptions[$]	1.13 (0.98-1.31)	0.083	1.06 (0.88-1.29)	0.500
SF-36 Physical component summary[$]	1.00 (0.99-1.02)	0.361	0.99 (0.97-1.01)	0.824
SF-36 Mental component summary[$]	1.02 (1.00-1.03)	0.004	1.00 (0.98-1.02)	0.568
IBDQ Bowel Symptoms score[$]	1.01 (1.00-1.03)	0.012	1.00 (0.98-1.02)	0.462
IBDQ Emotional Function score[$]	1.03 (1.10-1.06)	0.003	1.01 (0.98-1.05)	0.264
IBDQ Social Function score[$]	1.01 (1.00-1.03)	0.001	1.00 (0.99-1.02)	0.323
IBDQ Systemic Symptoms score[$]	1.02 (1.00-1.05)	0.020	0.98 (0.95-1.01)	0.348
IBDQ total score[$]	1.00 (1.00-1.01)	0.002	1.00 (0.99-1.00)	0.523