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Contributors' Statement Page

Dr. Wallach conceptualized the study and organized the consortium of institutions. Dr. Rosenbaum and Dr. Wallach designed the study, data collection instrument, and analytical framework. Drs Castro Ochoa, Tang, Tomer, Hasan, and Goldfarb collected data, organized local IRB approval at their respective institutions, and edited the manuscript. Dr. Rosenbaum harmonized, cleaned, and analyzed the data. Dr. Castro Ochoa, Dr. Rosenbaum, and Dr. Wallach wrote the manuscript. All authors reviewed, revised, and approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

Abstract:

Inflammatory Bowel Disease (IBD) pathogenesis is thought to be induced by a mix of genetic susceptibility, microbial populations, and immune triggers such as infections. SARS-nCoV2 may have increased capacity to generate autoimmune disease as evidenced by known spikes in diseases such as Type 1 Diabetes Mellitus. Public health interventions like masking and closures additionally created remarkable drops in typical viral infections, with remarkable shifts in ILI reporting in 2020. This study aims to evaluate the impact of SARS-nCoV2 and associated interventions on pediatric IBD presentation in NYC using records of new diagnoses at a consortium of four institutions between 2016 and June 2022. We fit time series model (ARIMA) to monthly and quarterly number of cases of each disease for January 2016-March 2020 and forecast the period between April 2020 and June 2022. We note no decrease in Ulcerative Colitis or Crohn's Disease in the aftermath of historic low levels of overall viral illness, and statistically significant increases in Crohn's Disease diagnoses and elevation in UC diagnoses creating a trend suggesting overall increase in IBD diagnoses exceeding the baseline rate of increase. These data suggest a possible linkage between SARS-nCoV2 infection rates and subsequent pediatric IBD presentation.

What is Known

- Infections may precipitate IBD pathogenesis
- SARS-nCoV2-related mitigation interventions substantially decreased viral infections in NYC
- SARS-nCoV2 has been associated with increases in some autoimmune diseases

What is New

- IBD rates did not decrease despite overall drop in viral illness
- Crohn's Disease Rates increased 4-6 months after initial SARS-nCoV2 spike in NYC
- Rates of IBD diagnoses appear higher than expected

Introduction

The SARS-nCoV2 pandemic has created multiple profound secondary effects in healthcare, but perhaps one of the most concerning is a possible capacity to generate increased rates of autoimmune disorders. Both pediatric and adult studies have demonstrated an increase in Type 1 diabetes diagnoses, and case reports and series suggest possible impacts in other autoimmune disorders[1-5]. Inflammatory Bowel Disease (IBD) is one of our greatest autoimmune disease concerns in the framework of pediatric gastroenterology. As currently understood, IBD pathogenesis appears to be a mix of genetic susceptibility, microbial interaction, and immune triggers such as infections. SARS-nCoV2 has a known predilection for intestinal tissue: gastrointestinal illness and protracted viral activity and shedding in stool accompany infection[6-9]. With interventions such as face masks and social distancing adopted at the onset of the SARS-nCoV2 pandemic, influenza-like-illness and other infectious disease incidence plummeted in the United States [10, 11]. Based on our theoretical understanding of IBD pathogenesis, reduced infectious disease during the pandemic would be expected to decrease IBD presentation rates, but decreased IBD incidence has not been observed clinically. As the location of many cases early in the SARS-nCoV2 pandemic, New York City (NYC) represents a valuable source of data to examine for any possible linkage with infections and IBD presentations, either positive or negative. Our study evaluated the association between the pandemic and new IBD diagnoses in NYC using data from a consortium of four NYC institutions: SUNY Downstate (Brooklyn), Maimonides Medical Center (Brooklyn), NYU Hassenfeld Children's Hospital (Manhattan), and the Children's Hospital at Montefiore (Bronx). We compared IBD rates after the SARS-nCoV2 pandemic with rates from the five years prior.

Methods

Data

We extracted data for IBD patients presenting in pediatric GI clinic at 4 institutions between January 2016 to June 2022 (n=587) from electronic health records (EHRs) after institutional review board approval of respective institutions.

Measures

Date of diagnosis was coded as year and month of diagnosis with the day removed for identifiability reasons. We measured the following demographic variables: age in years at diagnosis, EHR-recorded sex, race, and ethnicity. Age was categorized by FDA SARS-

nCoV2 vaccination approval age groups: 0-4, 5-11, 12-15, and 16-21. Race and ethnicity were measured by a free-entry field in the medical record, and more than one race and ethnicity were possible; however, race was often not reported for Hispanic/Latino-identified participants.

Individual-level association between SARS-nCoV2 infection and subsequent IBD would give stronger inference than temporal changes in IBD infection. For that aim, we gathered data about past SARS-nCoV2 infection before diagnosis.

Analysis

Due to potentially different seasonal variation and time to presentation, we analyzed CD and UC separately and excluded 29 cases of indeterminate IBD. Using April 2020 as the first month of the SARS-nCoV2 pandemic, we compared pre-pandemic versus pandemic periods with the Pearson chi-square test. For each disease, we also fit simple Poisson regression models for quarterly counts of CD and UC with an indicator for the pandemic that accounted for overdispersion, greater variance than expected in a Poisson distribution.

The quarterly counts of CD and UC appeared to be normal using both visual inspection of a quantile-quantile plot and the Shapiro-Wilk test: CD ($p=0.06$) and UC ($p=0.6$). We therefore fit an autoregressive integrated moving average model (ARIMA) to the quarterly number of cases of each disease for January 2016-March 2020 and forecast the subsequent 9 quarters (April 2020-June 2022) with 80% and 95% prediction intervals using the forecast library.[5] We repeated the ARIMA analysis with monthly data by fitting a model to pre-pandemic data and forecasting the subsequent 27 months (April 2020-June 2022).

Results

Of patients reviewed in this study, 43.1% were female. Median age at diagnosis was 14.0 years (range 2-21 years): 4.3% were ages 0-4 years, 25.6% were ages 5-11, 35.9% were ages 12-15, and 36.3% were 16-21. Race and ethnicity were provided as free-entry fields: 47.4% were White, 9.5% Black, 5.3% Asian, and 8.7% not reported; 22.5% were Hispanic, and 11.8% had Hispanic ethnicity status not reported. Patients diagnosed with IBD during the pandemic were less likely to be White and more likely to be Hispanic; patients did not differ in diagnosis, gender, age, Black or Asian identity, or county of residence from patients diagnosed before the pandemic **[Table 1]**. The distribution of quarterly counts of CD and UC before and during the pandemic did not differ according to a Wilcoxon test (Table 1) or Poisson regression with overdispersion

(CD incidence rate ratio (IRR) 1.26 (0.94, 1.68) with dispersion factor of 2.0; UC IRR 1.18 (0.78, 1.76) with dispersion factor of 1.6).

The quarterly pre-pandemic model for ulcerative colitis was ARIMA(0,0,0) (white noise) with a mean of 5.76 cases per quarter (se=0.79), residual standard deviation of 11.3; during the pandemic period, the forecast was an average of 5.76 cases per quarter with 80% prediction interval (1.45, 10.1) and 95% prediction interval (-0.83, 12.4). **[Figure 1]**

The monthly pre-pandemic model for ulcerative colitis was ARIMA(1,0,0) with a mean of 1.91 cases per month (se=0.28), lag-1 autocorrelation (AR1) of 0.30 (se=0.13), residual standard deviation of 2.00. The forecast varied only slightly across the interval. For ulcerative colitis, beginning in August 2020 an average of 1.90 cases were forecast with 80% prediction interval (0.00, 3.80) and 95% prediction interval (-1.00, 4.81). We noted more UC cases than forecast in May 2021 (5 cases), October 2021 (5 cases), and May 2022 (6 cases), compared with upper limit of 95% prediction interval of 4.81 cases **[Figure 2]**.

Overall, and trend for increased UC diagnoses was noted in the post-SARS-nCoV2 period, exceeding expected increases from the pre-pandemic trend. The pre-pandemic model for ulcerative colitis was ARIMA(1,0,0) with a mean of 1.91 cases per month (se=0.28) and lag-1 autocorrelation (AR1) of 0.30 (se=0.13). The residual standard deviation is 2.00.

The quarterly pre-pandemic model for Crohn's disease was ARIMA(0,0,0) (white noise) with a mean of 14.0 cases per quarter (se=1.09), residual standard deviation of 21.4; during the pandemic period, the forecast was an average of 14.0 cases per quarter with 80% prediction interval (8.07, 19.93) and 95% prediction interval (4.94, 23.06). We noted more CD cases than forecast in the third quarter of 2020 and first quarter of 2022, which had respectively 26 cases and 31 cases compared with upper limit of 95% prediction interval of 23.0 **[Figure 1]**.

The monthly pre-pandemic model for Crohn's disease was ARIMA(0,0,0) (white noise) with mean of 4.67 cases per month (se = 0.37), and residual standard deviation of 6.99. The forecast was uniform across the interval because the number of Crohn's disease cases per month were white noise. For Crohn's disease, an average of 4.67 cases was forecast with 80% prediction interval (1.28, 8.05) and 95% prediction interval (-0.51, 9.85). We noted more CD cases than forecast in July 2020 (12 cases), September 2020 (10 cases), February 2022 (11 cases), and March 2022 (13 cases), compared with upper limit of 95% prediction interval of 9.85 cases **[Figure 2]**.

One patient had a positive antibody test before diagnosis and 7 patients had positive PCRs test before diagnosis. No records indicated negative tests.

Discussion

We observe two key findings: first, a tremendous decrease in overall rates of viral infection did not decrease CD and UC presentation rates, suggesting either diminished importance of viral infection as a pathogenic trigger of IBD or a strong capacity for SARS-nCoV2 to drive IBD pathogenesis. Second, we observe a significant increase in CD diagnoses with a possible temporal linkage of 4-6 months after pre-omicron peak SARS-nCoV2 infection in NYC in March/April 2020, as well as peaks in diagnoses at approximately the same timing occurring in the aftermath of the Omicron wave starting November 2021. The demographic shifts in IBD diagnosis corresponds with SARS-nCoV2 infection demographics: more common in Hispanic populations and less likely in White populations[12]. Our finding of a decreased proportion of Caucasian patients and increased proportions of Hispanic patients aligns well with documented SARS-nCoV2 prevalence in the time frame of our study, suggesting a possible linkage. These temporal and demographic associations suggest an effect, but they do not demonstrate a linkage of CD with SARS-nCoV2 due to lack of testing data in the EHRs and multiple confounding effects which could generate an elevation in IBD: delays in care during lockdowns initially, recurrence of other viral infections, and overall delays in presentation for CD diagnosis.

Our study also shows the importance of incorporating SARS-nCoV2 test data and vaccination data into EHRs. We anticipate that SARS-nCoV2 infections were underestimated because children were under-tested during the early pandemic,[13] and because children may have been tested through programs that did not submit to the EHR, such as the NYC school-based surveillance testing program, NYC's testing program run by the public hospital system (NYC Health and Hospital Corporation), urgent care clinics, other health systems, or by home rapid tests. The results of school testing programs are reported to public health authorities, but these results do not come to the EHR except through ad hoc self-report. These problems will be compounded by at-home rapid tests that are not even reported to public health authorities.

Our study provides unique data from a city that experienced a substantial SARS-nCoV2 burden at the start of the pandemic from a population of patients attending pediatric gastroenterology clinics, as well as some of the most profound non-

pharmaceutical interventions and decreases in viral illness in the United States. However, our study shows temporal and demographic associations with the pandemic but not individual associations due to lack of testing data in the EHRs. The 4-6 month lag between the city's peak infection rate and CD could be consistent with a SARS-nCoV2 infection pathogenesis or with delayed presentation from cases during the lockdown period, although later trends suggesting elevation in CD diagnoses at other periods suggest a need for more detailed evaluation at a larger scale. IBD does not present with consistent patterns, resulting in wide variability in data. We also do not have documentation of the timing of SARS-nCoV2 infections, but specific variant lineage may drive different levels of autoimmunity; MISC incidence was lower when Omicron was the dominant variant compared with earlier variants of concern.

Our data does not include all pediatric gastroenterology groups in NYC, which may be impacted by variations in choice of institution for gastroenterology care. Vaccines were available for over a year for two-thirds of the patients in the cohort with new diagnoses since April 2020, and vaccines were widely available to NYC children and adolescents through mass vaccination sites and widespread vaccine bus visits including to all public schools. However, our study is not able to assess the impact of vaccinations due to significant heterogeneity in vaccine documentation. It is challenging to assess the potential impact on data beyond 2020 due to a partial recurrence of viral infections, however data derived from the New York State Department of Health Influenza-Like-Illness tracker demonstrates a substantial drop over regional baseline which continued through the '21-22 season[14].

Conclusions

Our study suggests two possible interpretations with substantial potential impact on IBD. First, our data may reflect that the underlying known increase in pediatric IBD has continued, which would strongly suggest that viral infection is not substantially related to IBD pathogenesis. Alternatively, our findings suggest that SARS-nCoV2 may have substantial capacity to generate autoimmunity. Large increases of SARS-nCoV2 infection in pediatric patients may have driven increases in IBD diagnoses, particularly Crohn's disease. Data infrastructure must be improved to incorporate SARS-nCoV2 test results and vaccine records to enable monitoring of ongoing changes in IBD incidence as new viral lineages emerge and during future pandemics.

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References

1. Gottesman BL, Yu J, Tanaka C, et al. Incidence of New-Onset Type 1 Diabetes Among US Children During the COVID-19 Global Pandemic. JAMA Pediatrics 2022.
2. Saad MA, Alfishawy M, Nassar M, et al. COVID-19 and Autoimmune Diseases: A Systematic Review of Reported Cases. Curr Rheumatol Rev 2021;17:193-204.
3. Barrett CE KA, Alvarez P, et al. Risk for Newly Diagnosed Diabetes >30 Days After SARS-CoV-2 Infection Among Persons Aged <18 Years — United States, March 1, 2020–June 28, 2021. Volume 71. MMWR Morb Mortal Wkly Rep, 2022:59-65.
4. Ehrenfeld M, Tincani A, Andreoli L, et al. Covid-19 and autoimmunity. Autoimmun Rev 2020;19:102597.
5. Muhammet Fatih A, Hamit T. Research Square 2021.
6. Arostegui D, Castro K, Schwarz S, et al. Persistent SARS-CoV-2 Nucleocapsid Protein Presence in the Intestinal Epithelium of a Pediatric Patient 3 Months After Acute Infection. JPGN Reports 2022;3:e152.
7. Jacobs JJL. Persistent SARS-2 infections contribute to long COVID-19. Med Hypotheses 2021;149:110538.
8. Kalkeri R, Goebel S, Sharma GD. SARS-CoV-2 Shedding from Asymptomatic Patients: Contribution of Potential Extrapulmonary Tissue Reservoirs. Am J Trop Med Hyg 2020;103:18-21.
9. Yusuf F, Fahriani M, Mamada SS, et al. Global prevalence of prolonged gastrointestinal symptoms in COVID-19 survivors and potential pathogenesis: A systematic review and meta-analysis. F1000Res 2021;10:301.
10. Sun L, Nava GM, Stappenbeck TS. Host genetic susceptibility, dysbiosis, and viral triggers in inflammatory bowel disease. Curr Opin Gastroenterol 2011;27:321-7.
11. Sullivan SG, Carlson S, Cheng AC, et al. Where has all the influenza gone? The impact of COVID-19 on the circulation of influenza and other respiratory viruses, Australia, March to September 2020. Euro Surveill 2020;25.
12. Li M, Yuan F. Historical Redlining and Resident Exposure to COVID-19: A Study of New York City. Race Soc Probl 2022;14:85-100.
13. Peaper DR, Murdzek C, Oliveira CR, et al. Severe Acute Respiratory Syndrome Coronavirus 2 Testing in Children in a Large Regional US Health System During the Coronavirus Disease 2019 Pandemic. Pediatr Infect Dis J 2021;40:175-181.
14. Health NYSDo. Weekly Influenza Surveillance Report - June 25th, 2022, 2022.
15. Leidman E, Duca LM, Omura JD, Proia K, Stephens JW, Sauber-Schatz EK. COVID-19 Trends Among Persons Aged 0-24 Years - United States, March 1-December 12, 2020. *MMWR Morb Mortal Wkly Rep*. 2021;70(3):88-94. Published 2021 Jan 22. doi:10.15585/mmwr.mm7003e1

Table 1: Demographics of participants (2016- June 2022)

	All participants	Jan. 2016 – Mar. 2020	April 2020 – Jun. 2022	P-value
N	587	351	236	
Diagnosis				0.6
Crohn's Disease (CD)	399 (68.0%)	238 (67.8%)	161 (68.2%)	
Ulcerative Colitis (UC)	159 (27.1%)	98 (27.9%)	61 (25.8%)	
Undetermined	29 (4.9%)	15 (4.3%)	14 (5.9%)	
Quarterly CD cases	Mean 15.3 (Variance 34.3) Median 14.5, IQR (11, 17)	Mean 14.0 (Variance 21.4) Median 13, IQR (11, 16)	Mean 17.7 (Variance 54.5) Median 16, IQR (14, 21)	0.2
Quarterly UC cases	Mean 6.1 (Variance 9.5) Median 6, IQR (4, 8)	Mean 5.8 (Variance 11.3) Median 4, IQR (4, 8)	Mean 6.8 (Variance 6.2) Median 7, IQR (6, 8)	0.3
Documented SARS-nCoV2 infection	8 (1.4%)	0	8 (3.4%)	n.a.
Gender				0.7
Male	333 (56.7%)	197 (56.1%)	136 (57.9%)	
Female	253 (43.1%)	154 (43.9%)	99 (41.9%)	
Missing	1 (0.2%)	0	1 (0.4%)	
Age at diagnosis				0.8
0-4	15 (4.3%)	9 (2.6%)	4 (1.7%)	
5-11	150 (25.6%)	92 (26.2%)	58 (25.6%)	
12-15	211 (35.9%)	121 (34.5%)	90 (38.1%)	
16-21	213 (36.3%)	129 (36.8%)	84 (35.6%)	
Institution				0.01
Downstate	36 (6.1%)	15 (4.3%)	21 (8.9%)	
Maimonides	91 (15.5%)	63 (17.9%)	28 (11.9%)	
Montefiore	274 (46.7%)	155 (44.2%)	119 (50.4%)	
NYU	186 (31.7%)	118 (33.6%)	68 (28.8%)	
Race and ethnicity				
White	278 (47.4%)	183 (52.1%)	95 (40.3%)	0.03
Black	56 (9.5%)	30 (8.5%)	26 (11.0%)	0.2
Asian	31 (5.3%)	14 (4.0%)	17 (7.2%)	0.06
Hispanic	132 (22.5%)	70 (19.9%)	62 (26.3%)	0.02
Race missing	51 (8.7%)	22 (6.3%)	29 (12.3%)	
Ethnicity missing	69 (11.8%)	31 (8.8%)	38 (16.1%)	
Year of diagnosis				n.a.
2016	67 (11.4%)	67 (19.1%)	0 (0%)	
2017	85 (14.5%)	85 (24.2%)	0 (0%)	
2018	80 (13.6%)	80 (22.8%)	0 (0%)	
2019	90 (15.3%)	90 (25.6%)	0 (0%)	
2020	97 (16.5%)	29 (8.3%)	68 (28.8%)	
2021	102 (17.4%)	0 (0%)	102 (43.2%)	
2022	66 (11.2%)	0 (0%)	66 (11.2%)	
Location				0.3
Manhattan	35 (6.0%)	20 (5.7%)	15 (6.4%)	
Brooklyn	230 (39.2%)	150 (42.7%)	80 (33.9%)	
Queens	21 (3.6%)	12 (3.4%)	9 (3.8%)	
Bronx	172 (29.3%)	100 (28.5%)	72 (30.5%)	
Staten Island	12 (2.0%)	6 (1.7%)	6 (2.5%)	
Westchester	54 (9.2%)	28 (8.0%)	26 (11.0%)	
Rockland	36 (6.1%)	18 (5.1%)	18 (7.6%)	
Long Island	12 (2.0%)	10 (2.8%)	2 (0.8%)	
Other NY or PA or CT or NJ	5 (0.9%)	2 (0.6%)	3 (1.3%)	
Not reported	10 (1.7%)	5 (1.4%)	5 (2.1%)	

All percentages are column percentages. Race and ethnicity were reported in a free-entry field; they do not add to 100% because patients could be identified with multiple racial and ethnic categories. P-value from chi-square test of association between time period (pre-pandemic versus pandemic) and each variable. The distribution of quarterly counts were compared with a Wilcoxon test; we present the means and variances for reference, but the Wilcoxon test does not compare these.

Figure 1. Time series (ARIMA) of UC and CD. A) ARIMA time series analysis of UC presentation by 3-month period from 2016- June 2022 with 80% and 95% prediction intervals. B) ARIMA time series analysis of CD presentation by 3-month period from 2016- June 2022 with 80% and 95% prediction intervals.

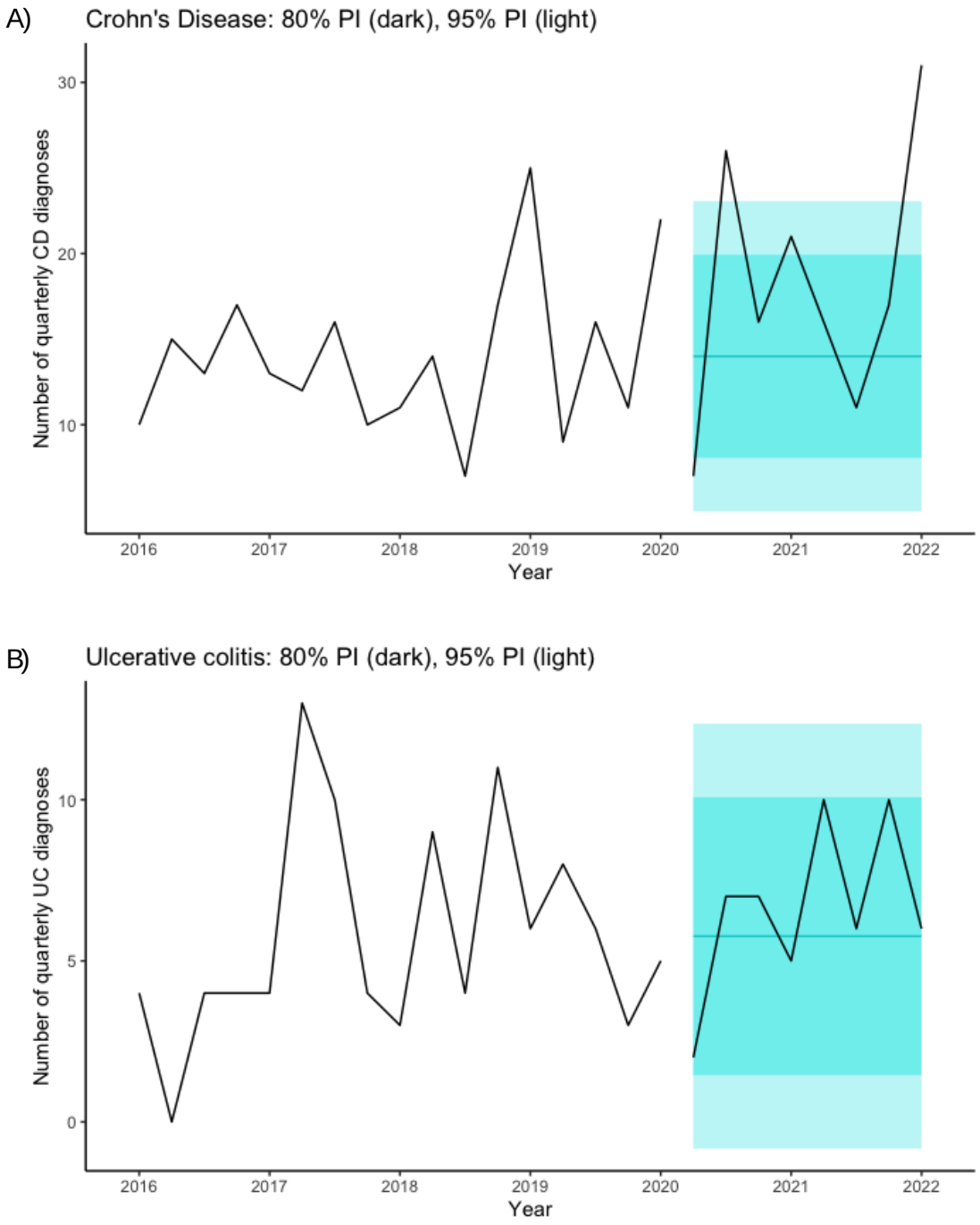
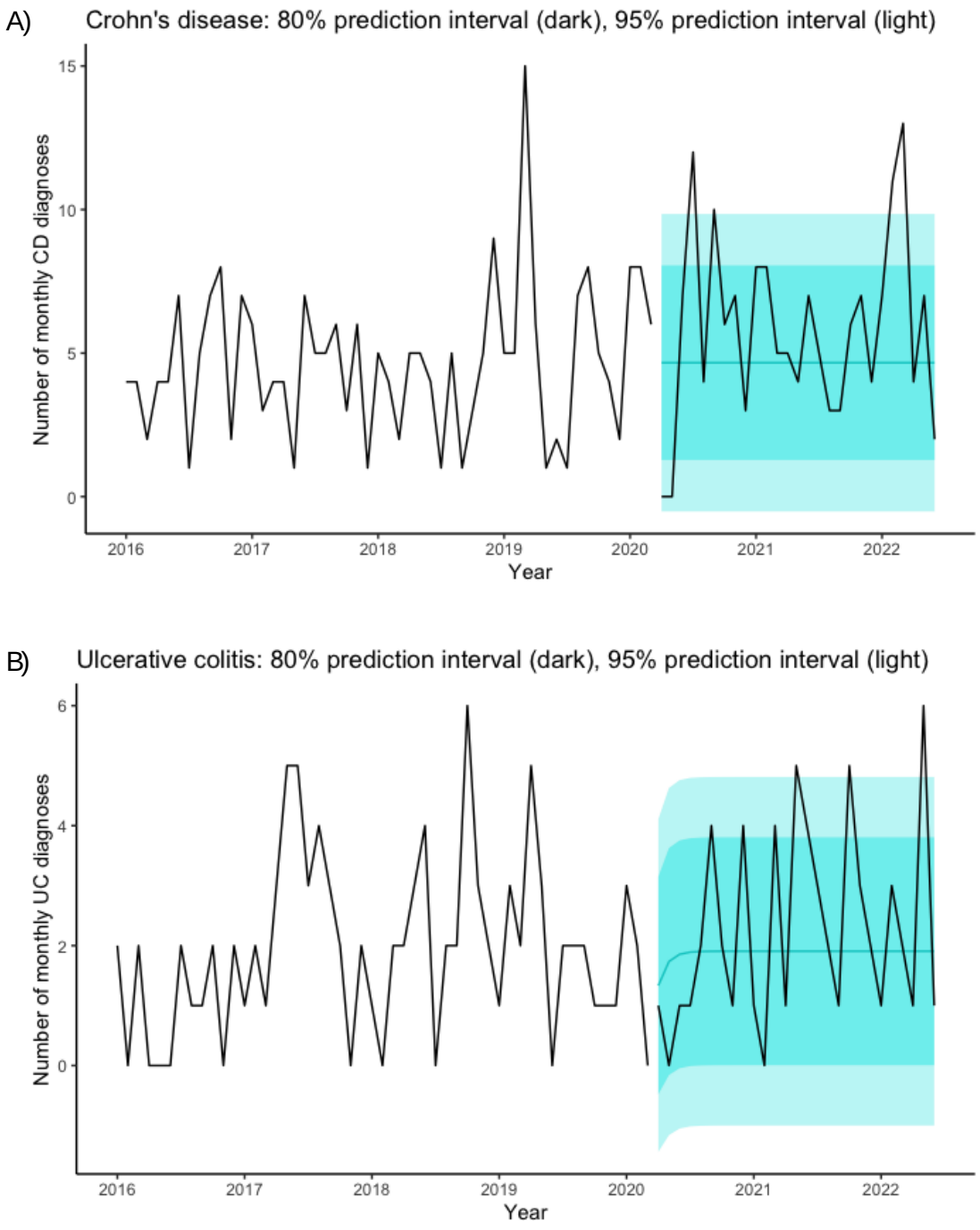


Figure 2. Time series (ARIMA) of UC and CD. A) ARIMA time series analysis of UC presentation by month from 2016- June 2022 with 80% and 95% prediction intervals. B) ARIMA time series analysis of CD presentation by month period from 2016- June 2022 with 80% and 95% prediction intervals.



Supplemental Table 1: Estimated and actual quarterly and monthly rates of UC and CD. Estimates are according to the ARIMA models; these data are displayed in Figures 1 and 2.

		UC cases		UC estimate, 95% CI	
		Quarterly	Monthly	Quarterly	Monthly
2020 Q2	April 2020	2	1	5.76 (-0.83, 12.36)	1.33 (-1.44, 4.10)
	May 2020		0		1.73 (-1.16, 4.63)
	June 2020		1		1.85 (-1.05, 4.76)
2020 Q3	July 2020	7	1	5.76 (-0.83, 12.36)	1.89 (-1.01, 4.80)
	August 2020		2		1.90 (-1.00, 4.81)
	September 2020		4		1.90 (-1.00, 4.81)
2020 Q4	October 2020	7	2	5.76 (-0.83, 12.36)	1.91 (-1.00, 4.81)
	November 2020		1		1.91 (-1.00, 4.81)
	December 2020		4		1.91 (-1.00, 4.81)
2021 Q1	January 2021	5	1	5.76 (-0.83, 12.36)	1.91 (-1.00, 4.81)
	February 2021		0		1.91 (-1.00, 4.81)
	March 2021		4		1.91 (-1.00, 4.81)
2021 Q2	April 2021	10	1	5.76 (-0.83, 12.36)	1.91 (-1.00, 4.81)
	May 2021		5		1.91 (-1.00, 4.81)
	June 2021		4		1.91 (-1.00, 4.81)
2021 Q3	July 2021	6	3	5.76 (-0.83, 12.36)	1.91 (-1.00, 4.81)
	August 2021		2		1.91 (-1.00, 4.81)
	September 2021		1		1.91 (-1.00, 4.81)
2021 Q4	October 2021	10	5	5.76 (-0.83, 12.36)	1.91 (-1.00, 4.81)

	November 2021		3		1.91 (-1.00, 4.81)
	December 2021		2		1.91 (-1.00, 4.81)
2022 Q1	January 2022	6	1	5.76 (-0.83, 12.36)	1.91 (-1.00, 4.81)
	February 2022		3		1.91 (-1.00, 4.81)
	March 2022		2		1.91 (-1.00, 4.81)
2022 Q2	April 2022	8	1	5.76 (-0.83, 12.36)	1.91 (-1.00, 4.81)
	May 2022		6		1.91 (-1.00, 4.81)
	June 2022		1		1.91 (-1.00, 4.81)

		CD cases		CD estimate, 95% CI	
		quarterly	monthly	quarterly	monthly
2020 Q2	April 2020	7	0	14 (4.94, 23.06)	4.67 (-0.51, 9.85)
	May 2020		0		4.67 (-0.51, 9.85)
	June 2020		7		4.67 (-0.51, 9.85)
2020 Q3	July 2020	26	12	14 (4.94, 23.06)	4.67 (-0.51, 9.85)
	August 2020		4		4.67 (-0.51, 9.85)
	September 2020		10		4.67 (-0.51, 9.85)
2020 Q4	October 2020	16	6	14 (4.94, 23.06)	4.67 (-0.51, 9.85)
	November 2020		7		4.67 (-0.51, 9.85)
	December 2020		3		4.67 (-0.51, 9.85)
2021 Q1	January 2021	21	8	14 (4.94, 23.06)	4.67 (-0.51, 9.85)
	February 2021		8		4.67 (-0.51, 9.85)
	March 2021		5		4.67 (-0.51, 9.85)
2021 Q2	April 2021	16	5	14 (4.94, 23.06)	4.67 (-0.51, 9.85)
	May 2021		4		4.67 (-0.51, 9.85)
	June 2021		7		4.67 (-0.51, 9.85)
2021 Q3	July 2021	11	5	14 (4.94, 23.06)	4.67 (-0.51, 9.85)
	August 2021		3		4.67 (-0.51, 9.85)
	September 2021		3		4.67 (-0.51, 9.85)
2021 Q4	October 2021	17	6	14 (4.94, 23.06)	4.67 (-0.51, 9.85)
	November 2021		7		4.67 (-0.51, 9.85)

	December 2021		4		4.67 (-0.51, 9.85)
2022 Q1	January 2022	31	7	14 (4.94, 23.06)	4.67 (-0.51, 9.85)
	February 2022		11		4.67 (-0.51, 9.85)
	March 2022		13		4.67 (-0.51, 9.85)
2022 Q2	April 2022	14	5	14 (4.94, 23.06)	4.67 (-0.51, 9.85)
	May 2022		7		4.67 (-0.51, 9.85)
	June 2022		2		4.67 (-0.51, 9.85)