

# The impact of COVID-19 on treatment of patients with ovarian cancer in England

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## Introduction

- **Ovarian cancer (OC) has the highest mortality rate among all gynecological cancers** in developed countries
- **The majority of patients initially present with advanced-stage disease<sup>1-3</sup>**. As such, it is important that patients receive care in a timely manner.
- **The COVID-19 pandemic led to substantial disruption in health care delivery across the globe<sup>4-7</sup>**, including cancer care.

1. **Adult female patients with OC (ICD-10 code C56x, C57.0x, or C48x) were retrospectively identified between January 2014 and July 2023 from the Arcturis UK dataset (Figure 2) using de-identified secondary care EHR.**

2. **Study design set up (Figure 1):** Patients were considered as 'active' 60-days prior to first available OC diagnosis until the date of their last observation within the data or death.

3. **Standardised monthly rates were calculated to examine the impact of the pandemic.**

$$rate_{standardised} = \frac{30}{N_{(days\ in\ month)}} \times \frac{N_{observations}}{N_{active}}$$

4. **Autoregressive integrated moving average (ARIMA) forecasting models were fit using three years of pre-pandemic data (1st March 2017 to 28th February 2020) to estimate the counterfactual rates between 1st March 2020 and 30th April 2021 had the pandemic not occurred.**

## Objective

1. To examine the **associations between the COVID-19 pandemic and the routine monitoring and treatment of OC patients** in England.

## Methods

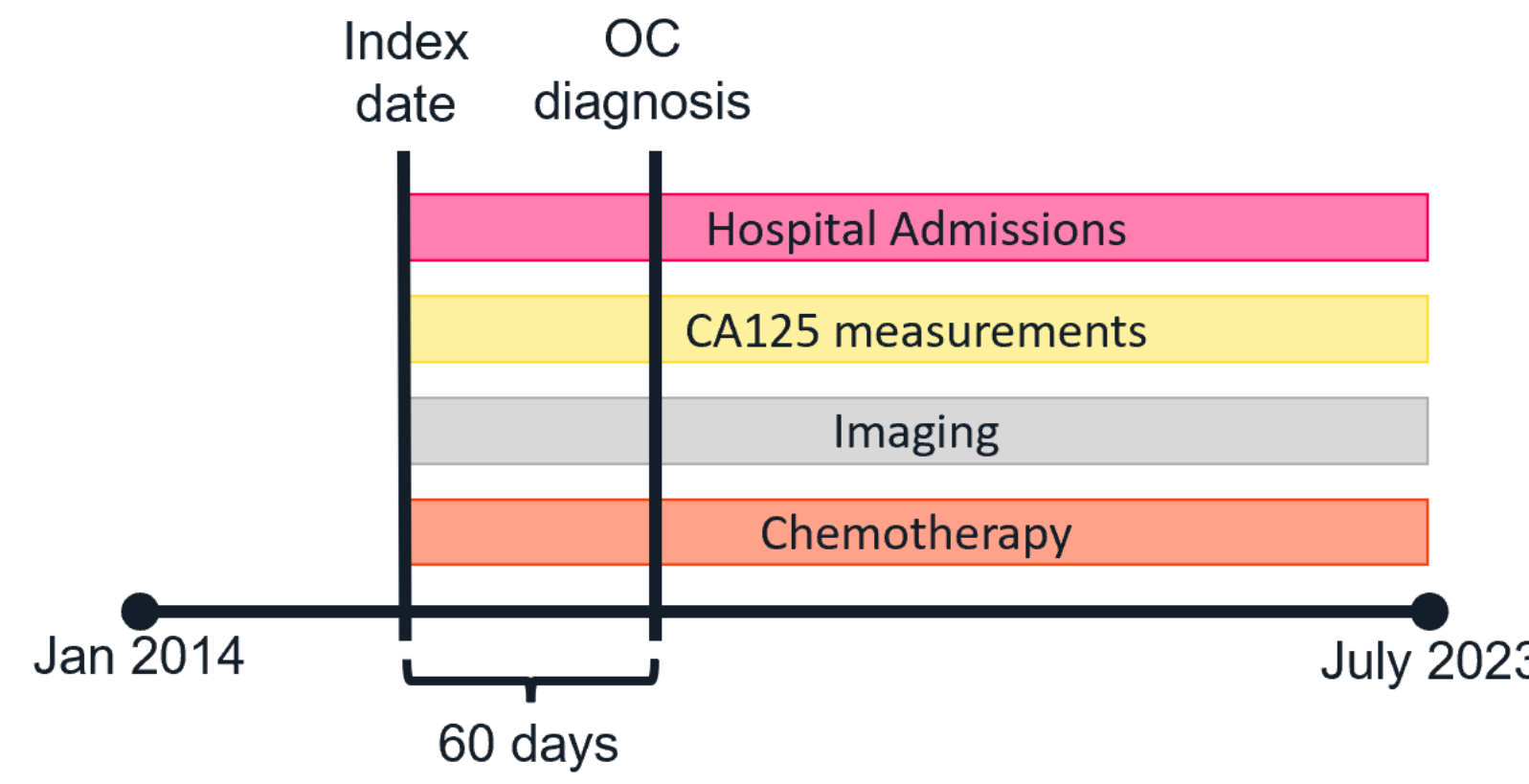


Figure 1. Pictogram of the study design.

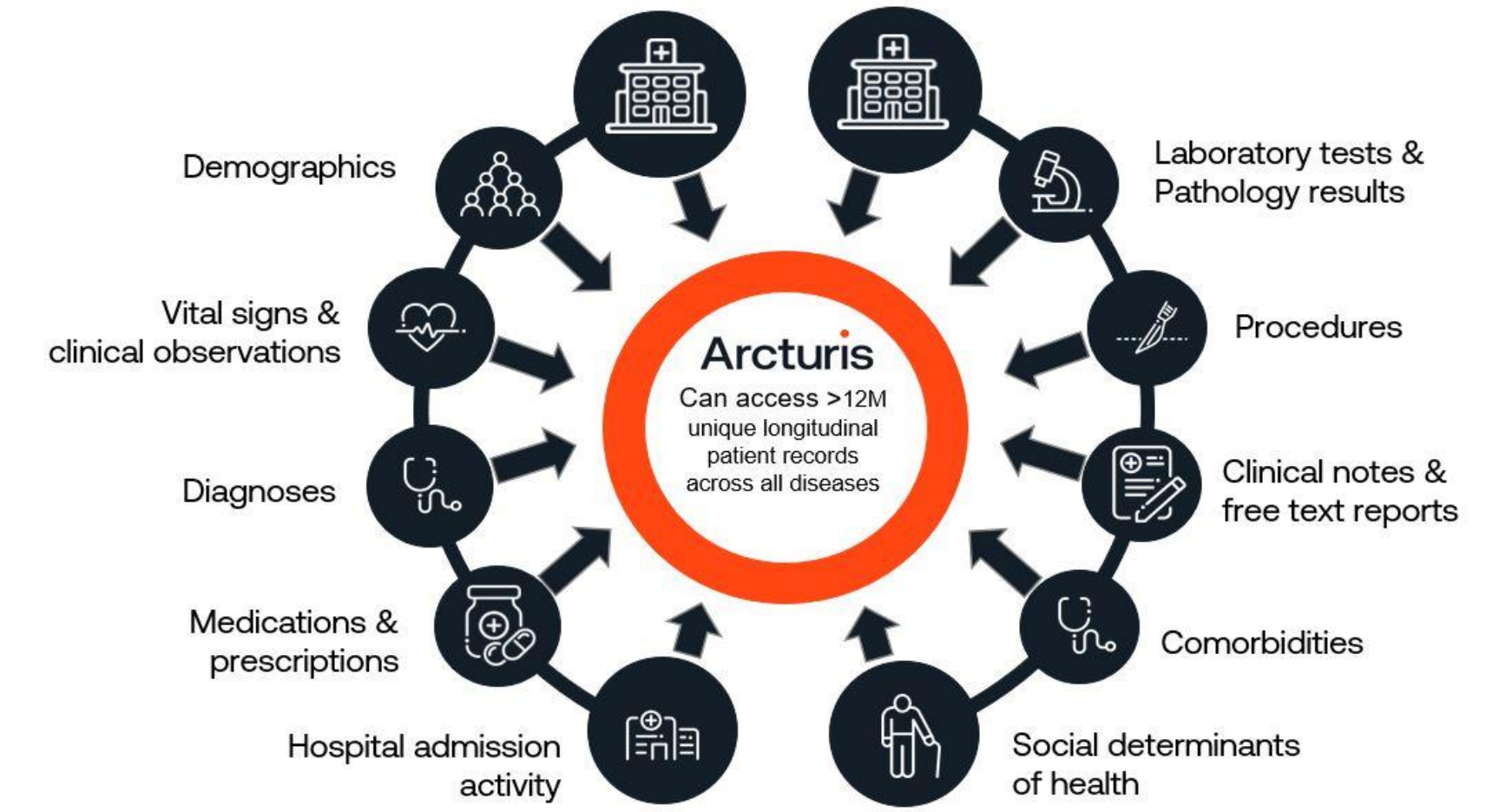


Figure 2. Types of data included in the Arcturis UK dataset.

## Results

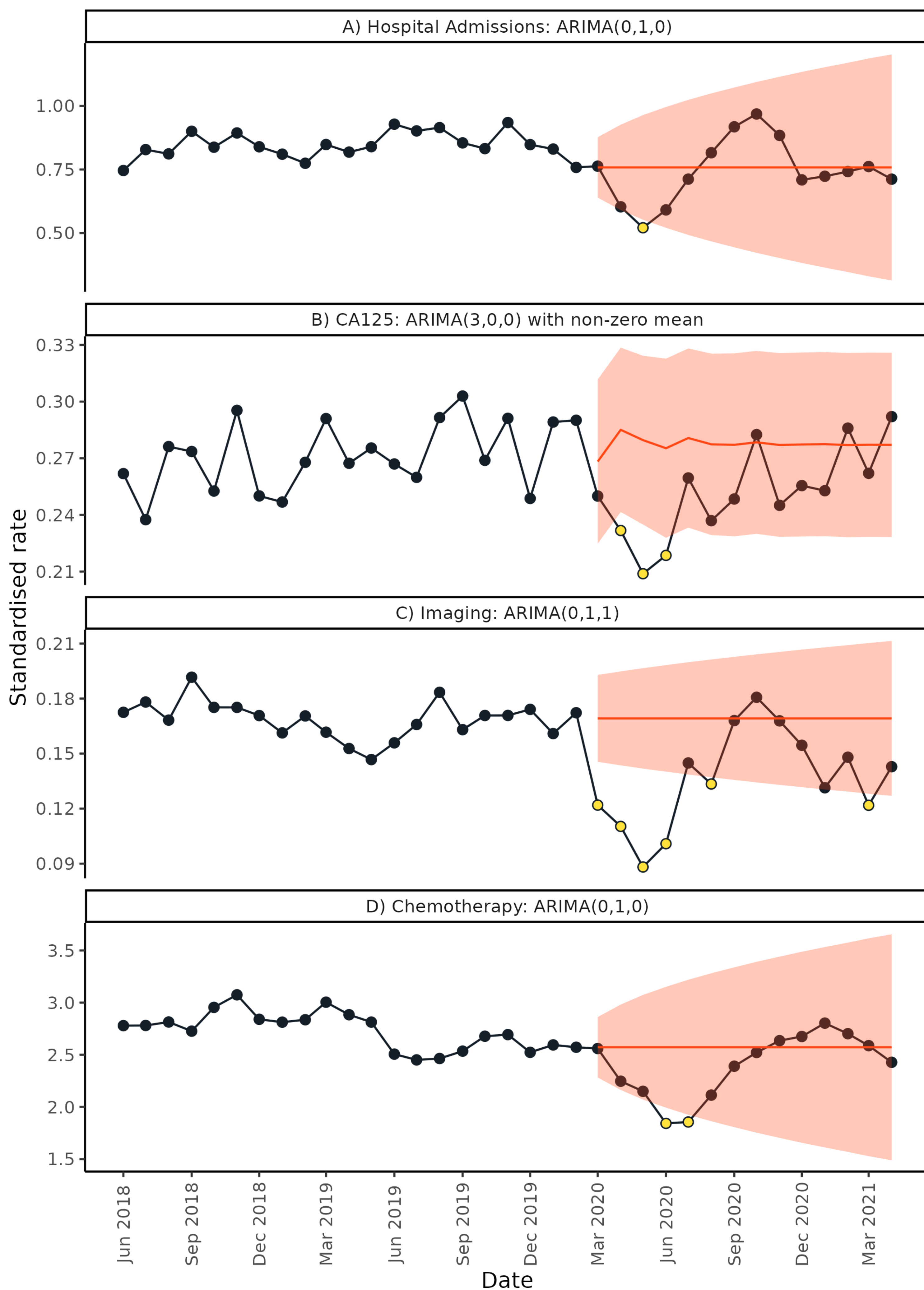


Figure 3: Trajectories of standardised rates of hospital admissions (A), CA125 measurements (B), imaging (C), and chemotherapy administrations (D). Red line is the predicted counterfactual levels with a 95% prediction interval (PI). Dots in yellow are highlighting points that lie outside of the 95% PI. CA125 and Imaging rates represent the average number of tests performed per active patient per month (PPPM). Hospital admission rates represent the number of days in hospital PPPM. Chemotherapy rates represent the number of days spent on a chemotherapy regimen PPPM.

- A total of **4,303 adult female OC patients** were identified and represented a mixture of incident and prevalent cases.
- Following the announcement of the first COVID-19 lockdown in the UK, **the number of days patients were in hospital decreased**, reaching its lowest level in May 2020, before returning to pre-pandemic levels by July 2020 (see Figure 3A).
- **CA125 testing decreased significantly compared to pre-pandemic levels** between April and June 2020. Rates can then be seen to gradually increase back to normal (see Figure 3B).
- There was a **sharp decrease in imaging** from just before the first lockdown announcement (March 2020) persisting until July 2020, though **levels do not appear to have stabilised completely back to pre-pandemic levels** up to a year later (see Figure 3C).
- Subsequently, the **number of patients actively receiving chemotherapy each month decreased, with significantly lower levels in June and July 2020**. This gradual decrease is linked to **fewer patients beginning a new line of therapy** following the lockdown announcement, while patients who were already receiving therapy prior to the announcement continued to receive their full course of treatment. **Levels can be seen to gradually return to normal levels in the following months** (see Figure 3D).

Variable	Cohort	Missing (%)
Duration patients were 'active' (months) (median [IQR])	18.2 [6.21 – 44.2]	0
Age at first OC diagnosis record (median [range])	66.7 [18.1 – 98.9]	0
Ethnicity		29.4
Asian	48 (1.6%)	
Black	13 (0.4%)	
Mixed and Other	43 (1.2%)	
White	2933 (96.6%)	
ECOG at first OC diagnosis record		54.9
0	1003 (51.6%)	
1	690 (35.5%)	
2+	249 (12.8%)	
Cancer stage at first OC diagnosis record		49.4
I	552 (25.4%)	
II	142 (6.5%)	
III	765 (35.2%)	
IV	388 (17.8%)	
Advanced but unknown III/IV	329 (15.1%)	

Table: Summary of patient characteristics at the time of first recorded OC diagnosis ± 180 days.

## Conclusions

- The COVID-19 pandemic led to a **significant reduction in disease monitoring** of patients with OC and subsequently a **delay in treatment** being received.
- It is **too early to tell the full impact of this delay** of treatment on the clinical outcomes of these patients.

## Acknowledgements

This work uses data provided by patients and collected by the NHS as part of their care and support. We believe using patient data is vital to improve health and care for everyone and would, thus, like to thank all those involved for their contribution.

## References

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