

Effects of Covid-19 on contraceptive prescribing in Scottish General Practices.

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Short title

Covid-19 and contraception in Scotland.

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Keywords

- Covid-19
- Contraception
- General practice

Abbreviations

COCP	Combined oral contraceptive pill
POP	Progestosterone-only pill
LARC	Long-acting reversible contraception
BNF	British National Formulary
IUS	Intra-uterine system
IUD	Intra-uterine device
EC	Emergency contraception
NHS	National Health Service
UK	United Kingdom

Abstract

1 Introduction

Walker (2022) revealed changes in prescribing of contraception in English general practices between 2019 and 2020 due to the SARS-CoV-2 pandemic, and associated restrictions. Here it will be examined if this is the case in Scotland as well. This study examines changes in contraception prescribed by general practices in Scotland from January 2016 to January 2023.

One limitation of Walker’s (2022) study is the comparison of just three months of prescribing data in both 2019 and 2020. Here, a much longer timeframe is used; with data from January 2016 to January 2023.

To the best of the author’s knowledge, no retrospective long-term analysis has been conducted to assess the impacts of restrictions due to Covid-19 on access to reproductive healthcare in the UK.

In Scotland, as in the rest of the UK, the majority of healthcare is supplied free at the point of use by the National Health Service. This dataset does not cover private prescriptions, but this is likely to be a small proportion of contraceptive prescriptions in Scotland.

2 Materials and methods

This study is a retrospective longitudinal study from January 2016 to January 2023. Data from the Scottish Health and Social Care Open Data repository (<https://www.opendata.nhs.scot>) was used. This dataset provides an overview of prescriptions dispensed in the community throughout Scotland. The overwhelming majority of these are prescribed in general practices, however some may be from other non-medical primary care prescribers, as well as prescriptions from hospitals dispensed in community pharmacies. The dataset is 100% complete for items dispensed in the community. However, it excludes items dispensed in hospitals, prisons, schools, and private prescriptions as well as prescriptions not presented for dispensing and those items dispensed but not submitted for payment. All data is aggregated and entirely anonymous.

R v4.3.0 (R Core Team 2023) was used to create a script to access data from the NHS Scotland Open Data API. Initially, the complete dataset is filtered using a SQL query to extract only contraceptive medicines by returning results with truncated BNF item codes beginning 07030* or 21040*. Subsequently, these data were categorised by truncated British National Formulary (BNF) (Joint Formulary Committee 2023) code (Table 1).

Table 1 *Truncated BNF item codes used during data extraction and example medicines in these categories.*

Truncated BNF Item Code	Category	Example BNF Item Description
0703021*	POP	Desogestrel Tablet 75mcg
0703010*	COC	Rigevidon Tablet
0703022M*	Injection	Depo-Provera Injection 150mg/ml 1ml Pre-filled Syringes
0703022N*	Injection	Noristerat Injection 200mg/ml 1ml Ampoules
0703023*	IUS	Mirena Intra-uterine System
21040*	IUD	T-Safe 380A QL Intra-uterine Contraceptive Device
0703022P*	Implant	Nexplanon Implant 68mg
0703050*	EC	Upostelle Tablet 1500mcg
0703010E0BG*	Patch	Evra Transdermal Patch
0703011*	Ring	NuvaRing 0.12mg/0.015mg per day Vaginal Delivery System

Due to inherent differences in prescribing frequencies between contraceptive methods, a standardised metric *months of contraceptive coverage* was calculated:

$$\text{Months of contraceptive coverage} = \frac{\text{Quantity of items dispensed}}{\text{Item pack size}} * \text{Duration of contraceptive action}$$

For example, an IUD with a five-year lifespan provides 60 months of contraceptive coverage ($1/1 * 60$), whereas a six-month prescription of a short-acting COCP provides 6 months of contraceptive coverage ($126/21 * 1$) despite 126 items being dispensed. To compare the dispensing of different contraceptives this results in the use of the unit months of contraceptive coverage per month ($MCC \cdot month^{-1}$)

Three different periods of time are considered: *pre-Covid-19*, defined as 01/01/2016-01/04/2020, *Covid-19* 01/04/2020-01/04/2022, and then *post-Covid-19* 01/04/2022-01/01/2023.

These are based on the beginning and end of social restrictions in Scotland due to Covid-19. Scotland entered the highest level of restrictions on daily activities in the following periods: 23/03/2020-19/07/2020 26/12/2020-16/04/2021 26/12/2021-21/03/2022 Here, this is termed *active lockdown*.

2.1 Patient and public involvement

There was no public or patient involvement in this study.

3 Results

3.1 Overview

Short-acting oral contraceptive pills, both COCP and POP, remained the most dispensed form of contraception throughout the duration of this study. However, the contraceptive patch increased in popularity in Scotland during and after the Covid-19 pandemic, laterly overtaking COCP (Figure 1).

Overall, combined hormonal contraceptives containing both oestrogens and progesterones were the most dispensed forms of contraception. Dispensing of long-acting reversible contraception (LARC) decreased during Covid-19, but has since returned to approximately pre-pandemic levels.

Periods of active lockdown resulted in large decreases in all forms of contraception being dispensed in Scotland (Table 3).

LARCs

Oral

Other

Timeframes	All LARC	IUS	IUD	Implant	Injection	All Oral	COCP	POP	All Other	Pa
Lockdown	28.89%	28.02%	25.38%	24.32%	42.69%	39.37%	31.30%	49.00%	54.64%	56.0
Peri-Lockdown	47.31%	48.89%	44.55%	42.86%	54.85%	53.17%	43.32%	64.92%	72.99%	76.0
Post-Lockdown	98.08%	112.54%	83.63%	81.10%	109.91%	97.86%	75.04%	125.07%	156.45%	165.0

3.2 Oral contraception

Oral contraceptives comprising of both COCP and POP were consistently the most prescribed form of contraception in Scotland, as measured by both months of contraceptive coverage dispensed per month, and the total number of items dispensed.

Prior to the Covid-19 pandemic, combined oral contraceptives were more frequently prescribed (mean percentage of total months of contraception dispensed per month 54.38%) than progesterone-only contraceptives (45.62%). However, during the period from April 2020 to April 2022, this trend was reversed (COCP: 43.84%, POP: 56.16%). Restrictions on face-to-face medical appointments during Covid-19 meant that the regular monitoring of BMI, and blood pressure were unable to take place. This likely lead to the decrease in COCP prescribing, and the growth in dispensing of POPs instead (Figure 2), which do not require the same patient monitoring. After this period, the trend has not restored to pre-Covid-19 levels, but in fact the dispensing of POP have increased (COCP: 41.70%, POP: 58.30%). Intriguingly, the differences in the proportion of COCP versus POP dispensed per month in Scotland have widened even after the lifting of Covid-19 associated restrictions (Figure 2).

However, some of this variation may be due to a decline in the total months of contraceptive coverage dispensed. During Covid-19, a mean of 287,775 MCC were dispensed per month, a 7.45% reduction in MCC dispensed per month compared with pre-Covid-19 levels (310,952). This trend has abated post-Covid-19, but the level of MCC dispensed per month remains 2.14% below pre-Covid-19 levels (304,309).

3.3 Long-acting reversible contraception

Long-acting reversible contraception (LARC), generally requires administration by a healthcare professional, unlike oral contraception. Due to the aforementioned restrictions on face-to-face appointments, LARC administration was severely decreased throughout the Covid-19 pandemic (Figure 3).

The decrease in injection dispensing throughout Covid-19 is less severe than other forms of LARC which

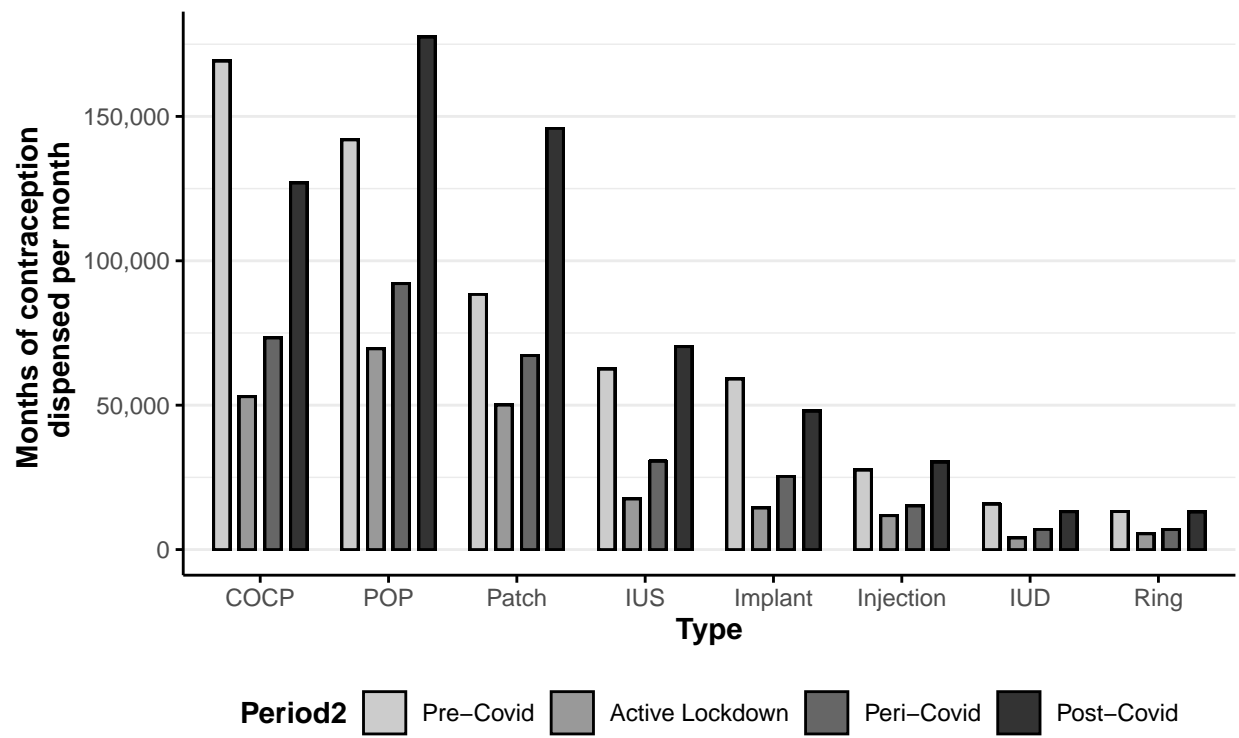


Figure 1. Covid-19 restrictions changed the proportions of categories of contraception dispensed in Scotland. Prior to Covid-19, the combined oral contraceptive pill (COCP), containing both oestrogens and progesterones was the most dispensed form of contraception. However, during the Covid-19 pandemic, this changed to the progesterone-only pill (POP), with dispensing of the contraceptive patch also increasing. Dispensing rates of long-acting reversible contraception (LARC) including the IUS, IUD, injection and implant decreased during Covid-19, whilst the contraceptive ring remained relatively stable.

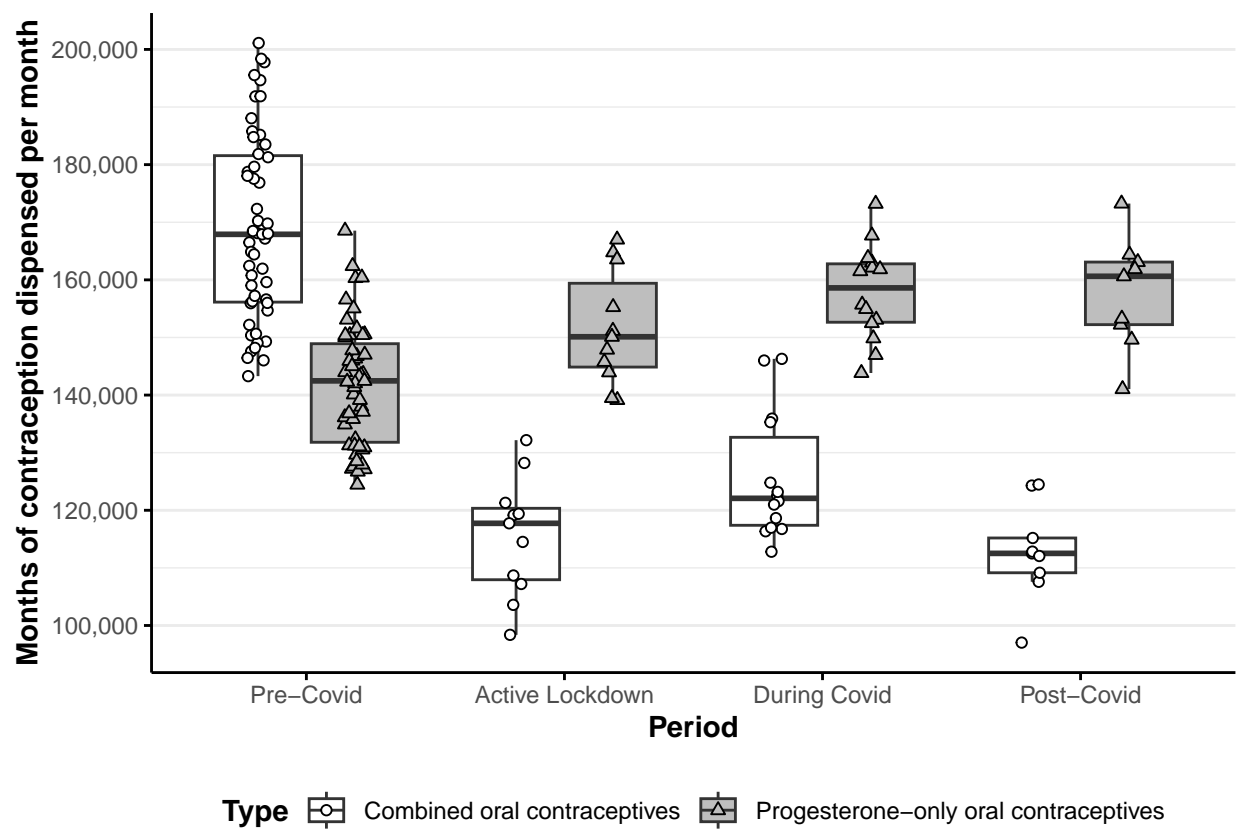


Figure 2. *Testing*

cannot be self-administered. There was a change in dispensing type, with Depo-Provera (IM) decreasing to 75.64% of pre-pandemic levels during periods of lockdown, and Sayana Press (SC) increasing to 111.04%.

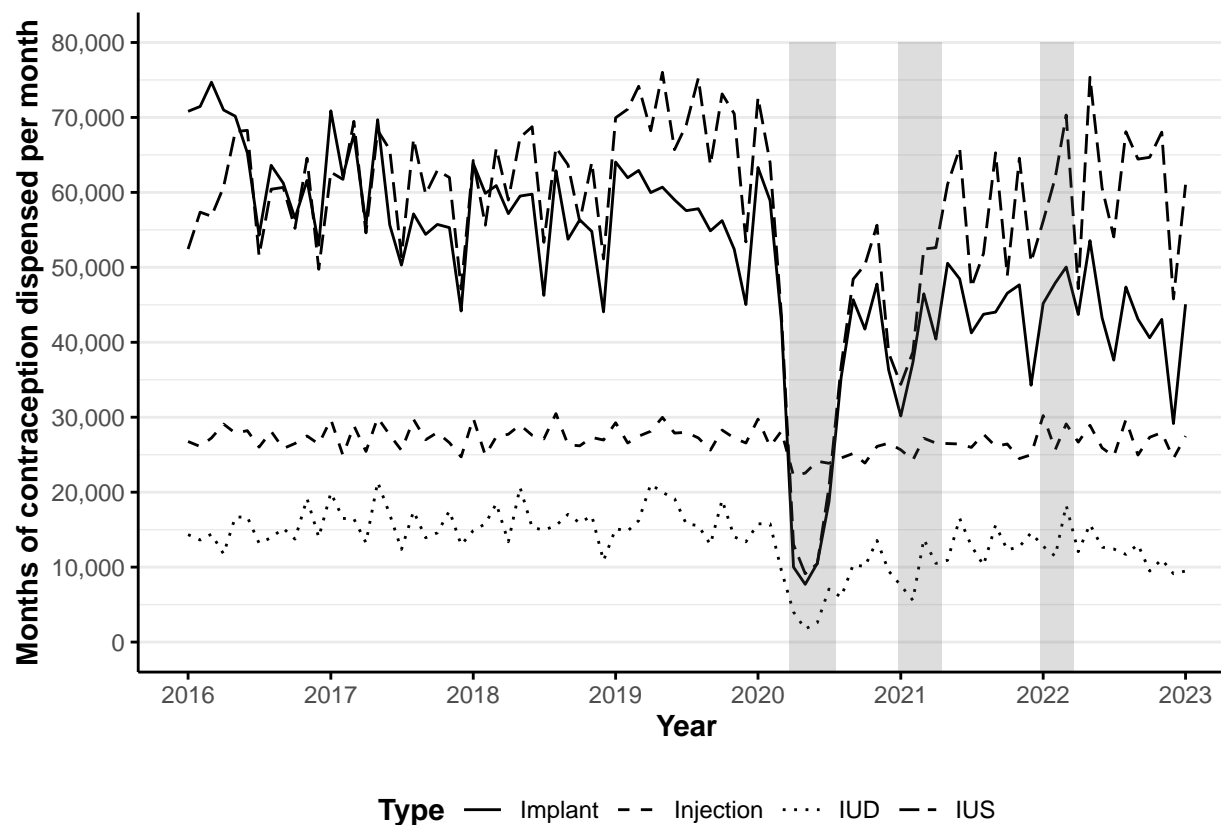


Figure 3. Grey shaded areas indicate active lockdowns.

3.4 Emergency contraception

Emergency contraception is available free-of-charge without a prescription from the majority of Scottish community pharmacies (MacCrimmon 2015). Due to social restrictions present in Scotland, it was expected to see a decrease in emergency contraception dispensing (Figure 4).

4 Discussion

The clear decreases in all forms of prescribed contraceptive provision in Scotland during Covid-19 presents a myriad of possible outcomes ranging from unwanted pregnancies to

Telemedicine terminations, easier to access and potentially increased due to this lack of effective contraceptive provision for Scottish women.

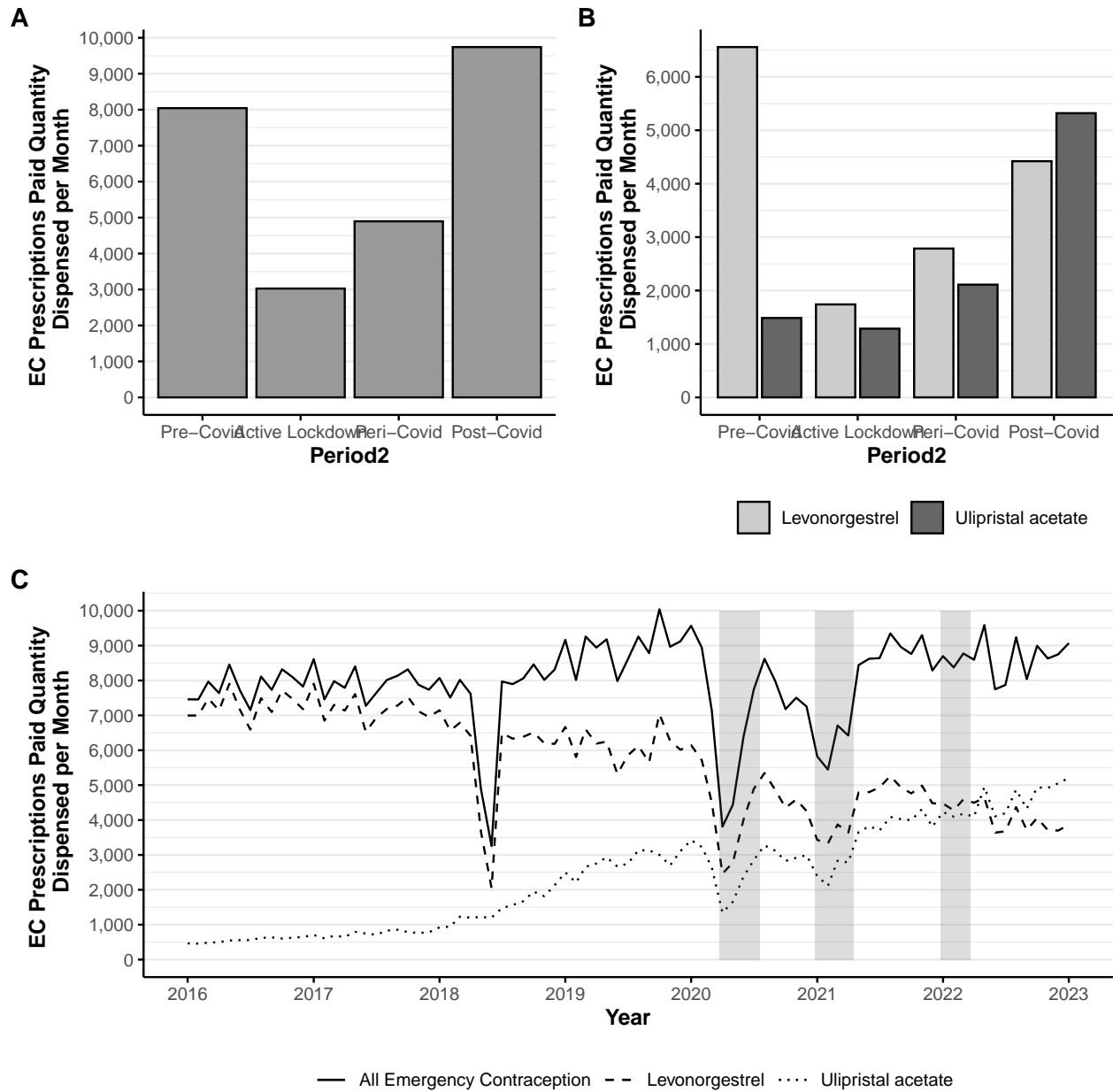


Figure 4. *Emergency contraception*

FRSH

The effects of these restrictions appear to have altered trends in contraceptive prescribing within Scottish general practice. For example, the increasing role of progestin-only oral contraception are clearly visible. This is also supported by access to POPs within community pharmacies in Scotland.

4.1 Limitations

Assumption that any changes observed between 2016 etc are due to lockdown and other restrictions, not due to other unknown factors.

A further assumption is made that the patient population seeking contraception from general practitioners is constant throughout the period of this study, and consequently, variances in prescribing rates between pre and post covid are due to changes in contraceptive prescribing rather than population level alterations.

Finally, it is also assumed that the drugs dispensed here are used purely for their licenced indication of contraception, not any alternative eg HRT or off-label uses.

Only data from Scotland were included in this study. Future work may explore if these impacts were similar in the other nations of the UK, or whether the devolved nature of healthcare policy within the UK created disparities in access to contraception during Covid-19 restrictions.

5 Conclusions

6 Reference List

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7 Supporting information