

AIMS

1. To evaluate the uptake of the COVID-19 vaccine in patients involved in the Welsh Fertility Institute against the standard of the Welsh population, and to consider possible reasons for differences between the two values.

2. To assess if there is any correlation between the COVID-19 vaccine uptake and success of the IVF/ICSI and FET processes, and any correlation between COVID-19 vaccine uptake and adverse pregnancy outcomes.

METHOD

• Data was initially collected from the Welsh Fertility Institute IVF/ICSI and FET databases. The time frame used was from 01/01/2022 until 10/06/2022 inclusive.

• The total number of patients recorded in the IVF/ICSI database during this time period was 235 - data for 53 patients was removed due to insufficient information regarding vaccination status, leaving data from 182 patients. Taking into account patients having multiple IVF/ICSI cycles within the time period resulted in 284 sets of data to be analysed.

• The total number of patients recorded in the FET database during this time period was 148 – data for 56 patients was removed due to insufficient information regarding vaccination status, leaving data for 92 patients. Taking into account patients having multiple FET cycles within the time period resulted in 117 sets of data to be analysed.

• In regards to both the IVF/ICSI and FET data, in situations where patients had undergone more than 1 round of IVF/ICSI/FET within the time period, it was viewed as one set of data in regards to overall uptake of COVID-19 vaccine, but separate sets of data in regards to outcomes.

• The specific areas evaluated were: uptake of COVID-19 vaccination in both IVF/ICSI and FET patients, total units of stimulatory drugs, number of oocytes collected, fertilisation rate, embryo transfer stage, pregnancy test outcome, presence of leftover embryos for freezing, and adverse pregnancy outcomes.

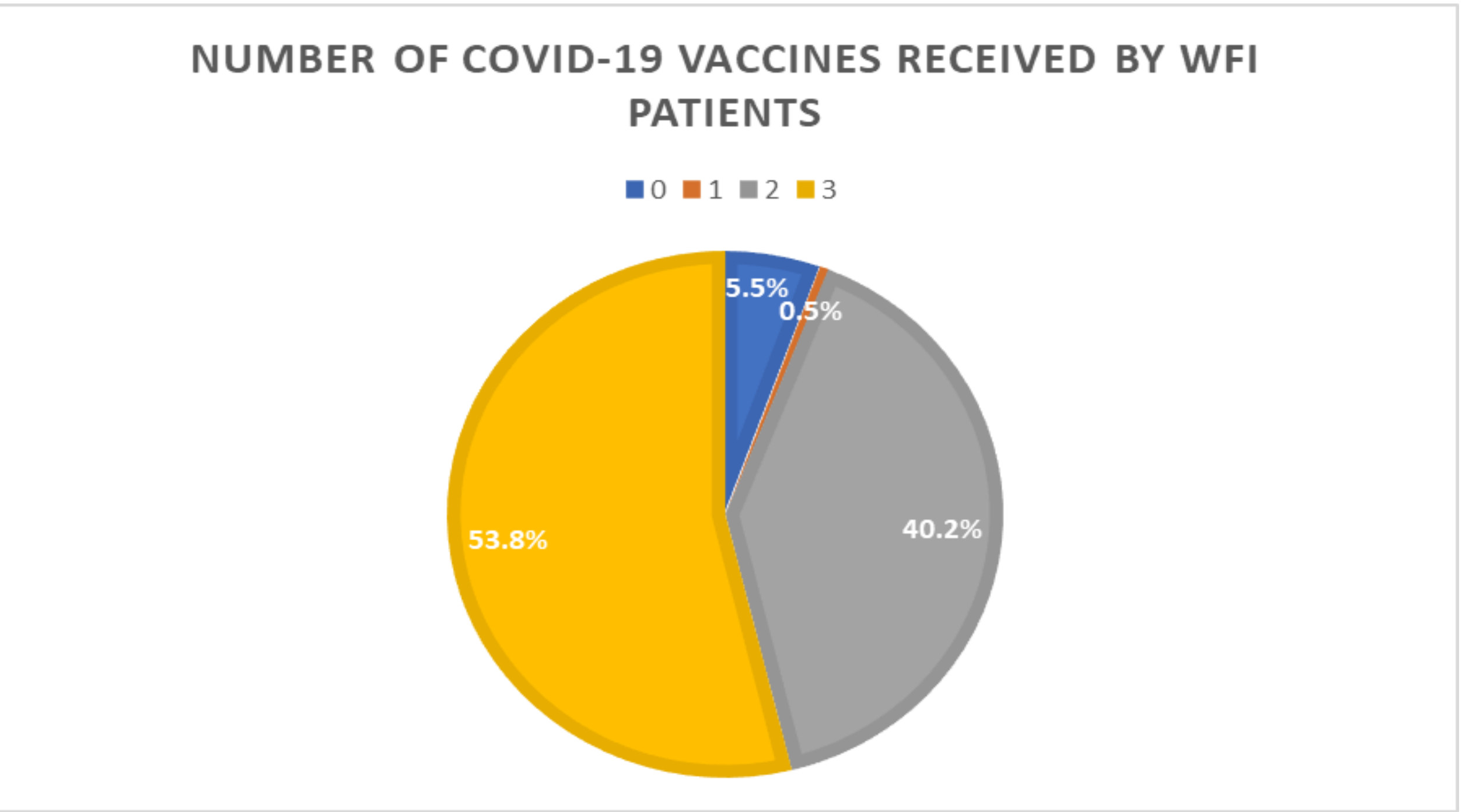
RESULTS – OVERALL UPTAKE OF COVID-19 VACCINE IN IVF-ICSI PATIENTS

• The most common number of vaccines received by patients undergoing IVF/ICSI was 3 vaccines (53.8% of the patients).

• 172 patients received at least 1 vaccine (94.5% of patients).

• 5.5% of patient had not received any vaccinations.

• In comparison, national statistics show that 77.3% of the population of Wales have received 3 vaccines (1). This shows that the uptake of the COVID-19 vaccine in WFI patients is lower than in Wales in general.



AN AUDIT TO EVALUATE THE UPTAKE OF THE COVID-19 VACCINATION IN PATIENTS ENGAGING IN FERTILITY SERVICES, AND THE IMPACT ON REPRODUCTIVE TECHNIQUE SUCCESS

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RESULTS – RELATIONSHIP BETWEEN NUMBER OF VACCINES RECEIVED AND REPRODUCTIVE TECHNIQUE SUCCESS IN IVF/ICSI PATIENTS

Relationship between number of vaccines received and number of oocytes collected in IVF/ICSI cycle

• In both vaccinated and unvaccinated patients, the most common category for number of oocytes collected was 5-9 oocytes.

Relationship between vaccination status and IVF/ICSI success

• The quantity of stimulatory drugs required appears to be slightly higher in patients who are vaccinated, with the average being 2800 IU compared to 2517 in unvaccinated patients. When analysing this using the unpaired t-test, the P value is calculated as 0.353. Since $p > 0.05$, the difference is not statistically significant.

• When using the T-test to analyse the number of oocytes removed in vaccinated and unvaccinated patients, the p value is calculated as 0.669. Since $p > 0.05$, the difference is not statistically significant.

• When using the T-test to analyse the fertilisation rate, the p values are shown to be 0.532 for IVF and 0.299 for ICSI, therefore the difference for both is not statistically significant.

• For ET stage, using the T-test shows a p value of 0.927, showing no statistically significant difference between vaccinated and unvaccinated patients.

• See **table 1**

Relationship between number of vaccines received and positive/negative pregnancy test in IVF/ICSI cycle

• There is a similar pattern in positive/negative pregnancy test outcomes in regards to both vaccinated and unvaccinated patients, with positive pregnancy test results accounting for 28.6% and 33.3% of unvaccinated and vaccinated patients respectively.

Relationship between number of vaccines received and adverse pregnancy outcomes (miscarriage, biochemical, ectopic) in IVF/ICSI cycle

• Patients who are unvaccinated have higher levels of adverse pregnancy outcomes than patients who are vaccinated – 14.3% of pregnancies in patients who were unvaccinated resulted in miscarriage/biochemical pregnancy, compared to 7.2% of patients who were vaccinated.

• These results were likely influenced by the small sample size of unvaccinated patients (accounting for only 7 sets of data).

VACCINATION STATUS	NUMBER OF IVF ROUNDS	NUMBER OF ICSI ROUNDS	AVERAGE NUMBER OF TOTAL DRUG UNITS USED (IU)	AVERAGE NUMBER OF OOCYTES REMOVED	FERTILISATION RATE (AVERAGE NUMBER OF FERTILISED EGGS)		ET STAGE (AVERAGE NUMBER OF BLASTOCYSTS ON DAY 5)	NUMBER OF CYCLES WITH LEFTOVER EMBRYOS TO FREEZE
					IVF	ICSI		
VACCINATED	79	68	2800 (SD = 1014.1)	9.5 (SD = 5.6)	5.4 (SD = 4.2)	5.5 (SD = 4.1)	3.0 (SD = 3.2)	61 (34.7%)
UNVACCINATED	4	3	2517 (SD = 1034.5)	8.8 (SD = 3.2)	6.8 (SD = 0.8)	3.0 (SD = 1.4)	3.0 (SD = 2.2)	3 (25.0%)

Table 1

RESULTS – OVERALL UPTAKE OF COVID-19 VACCINE IN FET PATIENTS

• Most common number of vaccines received by patients involved in the FET process was 2 vaccines (63.0% of patient). 97.8% of patients had received at least 1 vaccine.

• These results show that the proportion of FET patients who have received 3 vaccines (33.7%) is lower than in IVF/ICSI patients (53.8%) and for Wales in general (77.3%).

Uptake of COVID-19 vaccine in WFI patients undergoing FET

Vaccines Received	Percentage
0	1.1%
1	2.2%
2	63.0%
3	33.7%

RESULTS – RELATIONSHIP BETWEEN NUMBER OF VACCINED RECEIVED AND REPRODUCTIVE TECHNIQUE SUCCESS IN FET PATIENTS

Relationship between number of vaccines received and positive/negative pregnancy test in FET patients

• Similar results between receiving 2 vaccines and 3 vaccines in terms of positive/negative pregnancy outcome –similar level of positive results (36.1% and 32.3% respectively).

• The data set for patients who received 1 vaccine accounted for 1 patient. There were 0 patients within the unvaccinated category for this set of data.

Relationship between number of vaccines received and adverse pregnancy outcomes (miscarriage, biochemical, ectopic) in FET patients

• Data showed a link between number of vaccines received and adverse pregnancy outcomes – however, both the unvaccinated data set and ‘1 vaccine’ data set each had only one set of data – this small sample size could be responsible for these results.

• Reviewing data from the 2020 FET database from January 2020 to December 2020 (a group of unvaccinated patients) shows that 9.6% of pregnancies in this group were linked to adverse pregnancy outcomes (50% miscarriage, 50% biochemical, 0% ectopic) – this is similar to the findings from vaccinated patients, it may be used to show that there is little effect of vaccination status on rates of adverse pregnancy outcomes for FET patients.

DISCUSSION

• The uptake of the COVID-19 vaccine is lower in WFI patients in comparison to the general Welsh population. The proportion of the population who have received 3 vaccines is 77.3% in Wales, 53.8% of IVF/ICSI patients, and 33.7% of FET patients. The main reason for a low uptake of the COVID-19 vaccine in fertility patients is likely to be due to the spread of misinformation regarding risks to pregnancy (2), particularly via social media platforms. Furthermore, there is currently very little research into the effects of the COVID-19 vaccine in pregnant women (3), in particular patients who are pregnant through fertility services. This could be resulting in mistrust of the vaccine.

• The main limitation of this study was that because there were so few patients who hadn’t received any vaccinations, there was a very small sample size making up the ‘unvaccinated’ category – this made it difficult to compare vaccinated and unvaccinated patients in terms of success of FET/IVF/ICSI and adverse pregnancy outcomes.

• The main strength of this audit was that it was carried out by a medical student not employed by the WFI, and no funding was granted for this study – this limited bias.

• Future recommendations would be to repeat the study with a larger sample size, particularly in respect to the group of participants who are unvaccinated. It may also be useful to follow up on these patients to birth in order to understand if there is any relationship between vaccine uptake and complications during/following birth.

CONCLUSIONS

• Uptake of the COVID-19 vaccine is lower in WFI patients than in the general Welsh population.

• There is no statistically significant difference between vaccinated and unvaccinated IVF/ICSI patients in terms of: total units of stimulatory drugs required, number of oocytes removed, fertilisation rate for IVF/ICSI, or embryo transfer stage.

• There appears to be no effect of vaccination status on rates of positive/negative pregnancy test outcomes in IVF/ICSI patients

• No conclusions could be drawn from FET data due to insufficient data. However, including data from the 2020 data set indicates that vaccination status has no/little effect on positive/negative pregnancy test outcomes in FET patients, and does not appear to impact adverse pregnancy outcome rates.

REFERENCES

1. Our World in Data. Coronavirus (COVID-19) Vaccinations. 2022 [cited 2022 June 26]. Available from: [Coronavirus \(COVID-19\) Vaccinations - Our World in Data](#)

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3. The New York Times. The False Rumors About Vaccines That Are Scaring Women. 2021 [cited 2022 June 26]. Available from: [Opinion | False Rumors About Covid-19 Vaccines Are Scaring Women - The New York Times \(nytimes.com\)](#)