

Investigating the impact of COVID-19 on haemodialysis provision

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AIM

We aimed to assess **changes in dialysis provision** pre-and after the emergence of COVID-19 pandemic. We also considered whether COVID-19 impacted initial **dialysis access**.

KEY FINDINGS

- The proportion by which prevalent kidney failure (KF) patients decreased biannually was similar pre- and during pandemic.
- There were 14% fewer patients with incident KF pre-(41,350), compared with during the pandemic (35,406).

KEY FINDINGS

- We found **no difference** in first type of **dialysis access** pre-and during the pandemic

CONCLUSIONS

There did not appear to be an impact of the pandemic on care of patients with kidney failure. The proportion of fistulas as first dialysis access, did not fall following during the COVID-19 pandemic.

BACKGROUND

- The COVID-19 pandemic impacted the provision of routine healthcare services [1], with the potential to impact life-sustaining measures such as dialysis administration among people with chronic kidney disease (CKD).
- Arteriovenous fistulas (AVFs) are superior to central venous haemodialysis (HD) lines; with lower rates of sepsis and overall morbidity and mortality [2].
- We considered whether COVID-19 impacted provision of dialysis access surgery.

METHODS

- **Study design:** Descriptive retrospective cohort study using prevalent and incident cohorts.
- **Data source:** Hospital Episodes Statistics (HES)^a admitted patient care (APC) and outpatients (OP) datasets.
- **Prevalent cohort:** All patients with Diagnosis of Kidney failure (KF) incl. CKD5, any dialysis, & transplant, prevalent on 1st Jan 2018,
 - look back of 2 years from 2016 for diagnoses; excluded deaths in hospital.
- **Study periods**
 - pre-pandemic:**1 January 2018 – 31 December 2020
 - During pandemic:**1 January 2020 – 31 December 2022
- **Inclusion criteria**
 - 1) Diagnosis of KF using ICD-10 codes N185, I120, I131, I132.
 - 2) AND evidence of ongoing HD; ICD-10 code Z490, Z491, Z992 or OPCS^b codes X401, X403, X404, X408, X409.
- **Exclusion criteria**
 - 1) Exclude people with transplants pre-Jan 2018.
 - 2) Censor patients at the point that they have a transplant.
 - 3) Exclude patients with insertion of a peritoneal dialysis catheter, HD only.

RESULTS

Prevalent cohort

- 47,187 patients with kidney failure prevalent on 1st Jan 2018. Declined to 22,667 patients (48% reduction) in the 2 years pre-pandemic.
- Further reduction of 40% during the pandemic compared with pre-pandemic period, (22,667 to 13,999).
- The proportion receiving haemodialysis remained constant pre-and during the pandemic (63.6% and 61.4% respectively).

Incident cohorts

- There were 14% fewer patients with incident KF during the pandemic (35,406) than before (41,350).
- Proportion of incident KF patients receiving HD was similar pre-and during the pandemic 44.9% and 39.8% respectively.
- 26% of patients had records of access procedures pre-pandemic compared with 30% during.

	pre-Pandemic	During Pandemic		
Patients with kidney failure (n)	41,350	35,406		
Patients on haemodialysis N (%)	18,548 (44.9%)	14,097 (39.8%)		
Charlson comorbidity Index (CCI) score n (%)				
0	11,000 (59.3%)	6,933 (49.2%)		
1-2	4,371 (23.6%)	4,000 (28.4%)		
3-4	2,260 (12.2%)	2,103(14.9%)		
5+	917 (4.9%)	1,061 (7.5%)		
IMD quintile n (%)				
1 (most deprived)	2,905 (15.7%)	2,569 (18.2%)		
2	2,387 (12.9%)	2,028 (14.4%)		
3	1,998 (10.8%)	1,699 (12.1%)		
4	1,645 (8.9%)	1,470 (10.4%)		
5 (least deprived)	1,359 (7.3%)	1,200 (8.5%)		
Unknown	8,254 (44.5%)	5,131 (36.4%)		
Ethnicity n(%)				
Black	2,006 (10.8%)	2,412 (17.1%)		
White	8,971 (48.4%)	5,873 (41.7%)		
Asian	1,880 (10.1%)	1,207 (8.6%)		
Mixed	97 (0.5%)	58 (0.4%)		
Other	392 (2.1%)	253 (1.8%)		
Unknown	5,202 (28.0%)	4,294 (30.5%)		
	Fistula	Line	Fistula	Line
1 st access procedure recorded n(%)	4,839 (96.7%)	151 (3.0%)	4,067 (97.3%)	113 (2.7%)

Table 1. Baseline characteristics of incident patients
IMD = Indices of multiple deprivation

- There was no difference in the proportion of AVFs amongst access procedures pre- or during the pandemic (96.7% and 97.3% respectively).
- Most patients had no CCI comorbidities, 16.2% of patients were in the two most deprived quintiles pre-pandemic, 18.9% during.

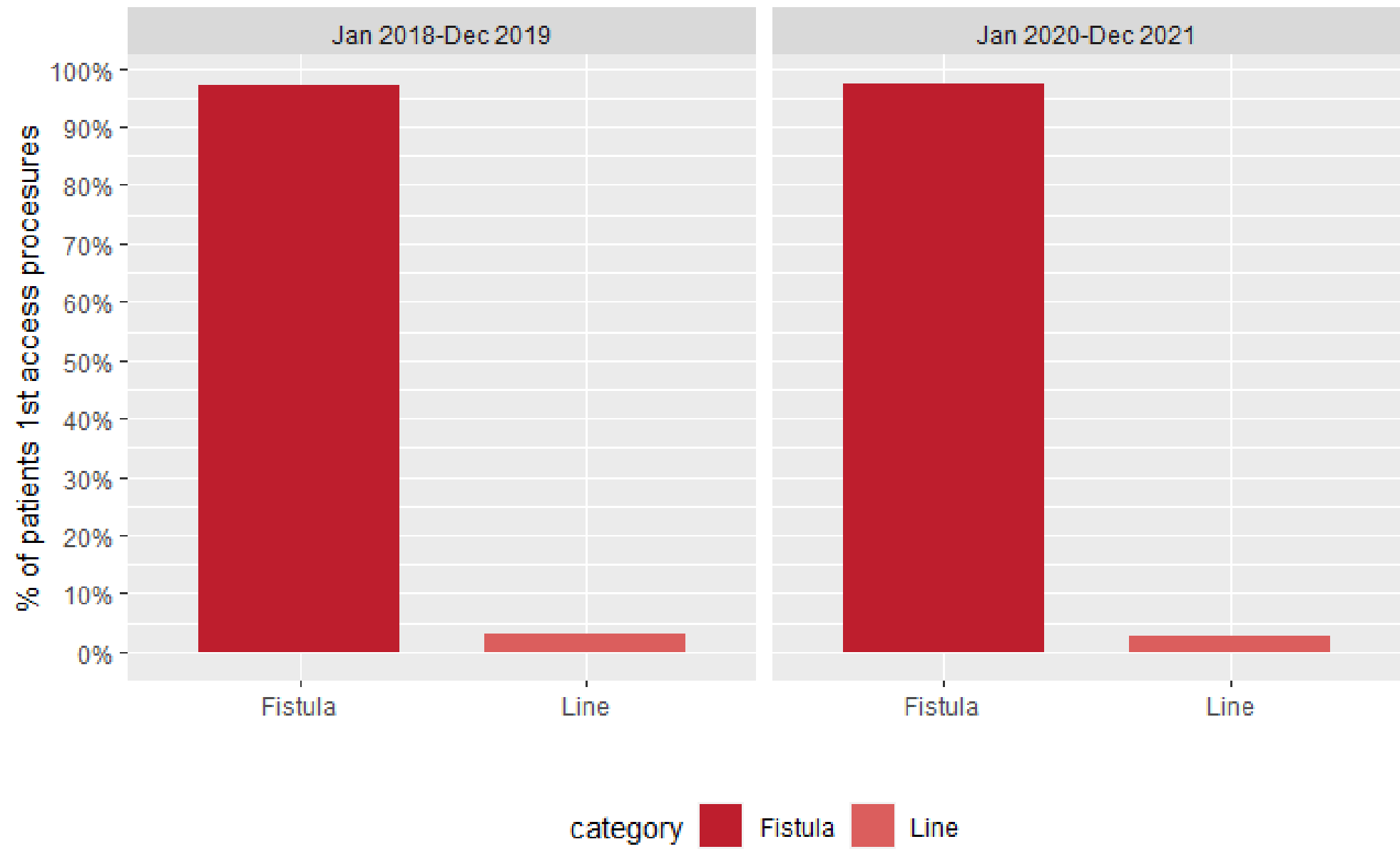


Figure 2. Proportion of patients with fistula and line access pre- (before) and during pandemic.

STRENGTHS AND LIMITATIONS

- National dataset that includes all government (NHS) funded healthcare in England.
- Capturing a diagnosis in inpatient requires hospital admission, diagnosis may occur in outpatient but the coding for this is not as reliable due to differences in reimbursement processes.
- Renal replacement therapy is centrally reimbursed so local HRG coding can be variable.
- Dialysis access can last several years, data was only available from 2016-2022, some dialysis access data were missing.

CONCLUSIONS

- There did not appear to be an impact of the pandemic on care of patients with kidney failure.
- The proportion of incident KF patients receiving dialysis was similar pre- and during pandemic.
- The proportion of fistulas as first dialysis access, as per recommendations, did not fall following during the COVID-19 pandemic.

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DISCLOSURES

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REFERENCES

1. Coronavirus » Delivering plan for tackling the COVID-19 backlog of elective care. Available at: <https://www.england.nhs.uk/coronavirus/delivering-plan-for-tackling-the-covid-19-backlog-of-elective-care/#waiting-list>. Accessed 19 October 2022.
2. Kumwenda M, Mitra S, Reid C., Clinical practice guideline: Vascular access for haemodialysis, 6th edition. 2015. Available at: www.renal.org/guidelines. Accessed 19 October 2022.

