

Supplementary table 1: Read codes (v2) used to identify pregnancy from the primary care data (GP)

Read code	Description
13H7.	Unwanted pregnancy
2711.	O/E - fundus 12-16 week size
2712.	O/E - fundus 16-20 week size
2713.	O/E - fundus 20-24 week size
2714.	O/E - fundus 24-28 week size
2715.	O/E - fundus 28-32 week size
2717.	O/E - fundus 34-36 week size
4453.	Serum pregnancy test positive
4654.	Urine pregnancy test positive
584..	Ultrasound in obstetric diagnosis
5841.	U-S obstetric scan requested
5842.	U-S obstetric scan normal
584B.	Viability US scan
584C.	Antenatal ultrasound result received
584D.	Antenatal ultrasound confirms intra-uterine pregnancy
584Z.	U-S obstetric diagnosis scan NOS
62...	Patient pregnant
621..	Patient currently pregnant
6212.	Pregnant - blood test confirms
6214.	Pregnant - on history
6216.	Pregnant - planned
6217.	Pregnant - unplanned - wanted
621C.	Unplanned pregnancy
621Z.	Patient pregnant NOS
622..	Antenatal care: gravida No.
623..	A/N care: obstetric risk
625Z.	A/N care: social risk NOS
628Z.	A/N risk NOS
62A..	A/N care provider
62A3.	A/N - shared care
62B..	Delivery booking place
62B3.	G.P. unit delivery booking
62B4.	Consultant unit booking
62B8.	Midwife unit delivery booking
62C..	Delivery booking - length of stay
62F..	Antenatal amniocentesis
62G..	Antenatal ultrasound scan
62GB.	Antenatal ultrasounds scan at 4-8 weeks
62GZ.	Antenatal ultrasound scan NOS

62L..	Antenatal blood group screen
62N..	Antenatal examinations
62N1.	A/N booking examination
62N3.	A/N 16-week examination
62O1.	Fetal movements felt
62X..	Length of gestation
62Y..	Routine antenatal care
62a..	Pregnancy review
62b..	Antenatal HIV screening
62c..	Antenatal screening
6776.	Pregnancy termination counselling
679E.	Antenatal education
7F051	Diagnostic amniocentesis
7F060	Cerclage of cervix of gravid uterus
7F25.	Obstetric monitoring
7F2B1	Ultrasound monitoring of early pregnancy
8B75.	Vitamin supplement - pregnancy
8H7W.	Refer to TOP counselling
8HHV.	Referral for termination of pregnancy
8HHf.	Refer to early pregnancy unit
8HT9.	Referral to antenatal clinic
8M6..	Requests pregnancy termination
95...	Maternity services admin.
9N1N.	Seen in antenatal clinic
L1...	Pregnancy complications
L10..	Haemorrhage in early pregnancy
L100.	Threatened abortion
L10y.	Other haemorrhage in early pregnancy
L11..	Antepartum haemorrhage, abruptio placentae, placenta praevia
L1246	Pre-eclampsia, unspecified
L13..	Excessive pregnancy vomiting
L130.	Mild hyperemesis gravidarum
L1300	Mild hyperemesis unspecified
L13y.	Other pregnancy vomiting
L13z.	Unspecified pregnancy vomiting
L1668	Urinary tract infection complicating pregnancy
L16y5	Abdominal pain in pregnancy
L1808	Diabetes mellitus arising in pregnancy
L1809	Gestational diabetes mellitus
L1825	Iron deficiency anaemia of pregnancy
L18A0	Cholestasis of pregnancy
L210.	Twin pregnancy
L25..	Known or suspected fetal abnormality

L264.	Intrauterine death
L280.	Oligohydramnios
L33z.	Umbilical cord complications NOS
L413.	Antenatal deep vein thrombosis
L510.	Maternal care for hydrops fetalis
Lyu21	[X]Other vomiting complicating pregnancy
Lyu25	[X]Other specified pregnancy-related conditions
Z212.	Antenatal care
Z22..	Pregnancy observations
Z225.	Normal pregnancy
Z226.	Pregnancy problem
Z227.	Confirmation of pregnancy
Z2291	Intrauterine pregnancy
Z22A.	Observation of pattern of pregnancy
Z22A1	Low risk pregnancy
Z22A4	Early stage of pregnancy
Z22AA	Wanted pregnancy
Z22AB	Unplanned pregnancy
Z22B1	Single pregnancy
Z22C1	Estimated date of delivery from last period
Z22C3	Length of gestation
Z22D1	Viable pregnancy
Z22D2	Non-viable pregnancy
Z22D3	Uncertain viability of pregnancy
ZV222	[V]Pregnancy confirmed
ZV223	[V]Pregnant state, incidental
ZV231	[V]Pregnancy with history of trophoblastic disease
ZV28.	[V]Antenatal screening
1531.	Last menstrual period-1st day
271B.	O/E - fundal size = dates
2726.	O/E - fetal presentation unsure
2766.	O/E - fetal heart 120-160
5391.	Obstetric X-ray - fetus
584A.	Dating/Booking US scan
67A..	Pregnancy advice
67A2.	Diet in pregnancy advice
67A3.	Pregnancy smoking advice
67AE.	Folic acid advice in first trimester of pregnancy
67AF.	Pregnancy advice for patients with epilepsy
7F261	Viability scan
7F2B.	Obstetric ultrasound monitoring
9511.	FP24 signed by patient
957..	FW 8-applic for presc exempt

9kv..	Pertussis vaccination programme pregnant women enhance service admin
9mK..	Pertussis vaccination in pregnancy invitation
9Nk3.	Seen in fetal medicine clinic
9NkN.	Seen in early pregnancy unit
9NV1.	Antenatal clinic
ZV286	[V] Antenatal screening for chromosomal anomalies
6556.	Pretussis vaccination in pregnancy

Supplementary table 2: ICD-10 version:2019 codes used to identify pregnancy from the hospital admissions data (PEDW)

ICD-10 code	Definition
O11X	Pre-eclampsia superimposed on chronic hypertension
O120	Gestational oedema
O121	Gestational proteinuria
O122	Gestational oedema with proteinuria
O13X	Gestational [pregnancy-induced] hypertension
O140	Mild to moderate pre-eclampsia
O141	Severe pre-eclampsia
O142	HELLP syndrome
O149	Pre-eclampsia, unspecified
O150	Eclampsia in pregnancy
O116X	Unspecified maternal hypertension
O200	Threatened abortion
O208	Other haemorrhage in early pregnancy
O209	Haemorrhage in early pregnancy, unspecified
O20	Haemorrhage in early pregnancy
O210	Mild hyperemesis gravidarum
O211	Hyperemesis gravidarum with metabolic disturbance
O212	Late vomiting of pregnancy
O219	Vomiting of pregnancy, unspecified
O220	Varicose veins of lower extremity in pregnancy
O223	Deep phlebothrombosis in pregnancy
O224	Haemorrhoids in pregnancy
O228	Other venous complications in pregnancy
O229	Venous complication in pregnancy, unspecified
O230	Infections of kidney in pregnancy
O234	Unspecified infection of urinary tract in pregnancy
O235	Infections of the genital tract in pregnancy
O239	Other and unspecified genitourinary tract infection in pregnancy
O244	Diabetes mellitus arising in pregnancy
O249	Diabetes mellitus in pregnancy, unspecified

O260	Excessive weight gain in pregnancy
O261	Low weight gain in pregnancy
O262	Pregnancy care of habitual aborter
O265	Maternal hypotension syndrome
O268	Other specified pregnancy-related conditions
O269	Pregnancy-related condition, unspecified
O280	Abnormal haematological finding on antenatal screening of mother
O281	Abnormal biochemical finding on antenatal screening of mother
O283	Abnormal ultrasonic finding on antenatal screening of mother
O289	Abnormal finding on antenatal screening of mother, unspecified
O300	Twin pregnancy
O301	Triplet pregnancy
O320	Maternal care for unstable lie
O321	Maternal care for breech presentation
O322	Maternal care for transverse and oblique lie
O324	Maternal care for high head at term
O326	Maternal care for compound presentation
O328	Maternal care for other malpresentation of fetus
O329	Maternal care for malpresentation of fetus, unspecified
O340	Maternal care for congenital malformation of uterus
O341	Maternal care for tumour of corpus uteri
O342	Maternal care due to uterine scar from previous surgery
O343	Maternal care for cervical incompetence
O344	Maternal care for other abnormalities of cervix
O346	Maternal care for abnormality of vagina
O347	Maternal care for abnormality of vulva and perineum
O348	Maternal care for other abnormalities of pelvic organs
O350	Maternal care for (suspected) central nervous system malformation in fetus
O351	Maternal care for (suspected) chromosomal abnormality in fetus
O352	Maternal care for (suspected) hereditary disease in fetus
O358	Maternal care for other (suspected) fetal abnormality and damage
O359	Maternal care for (suspected) fetal abnormality and damage, unspecified
O35	Maternal care for known or suspected fetal abnormality and damage
O360	Maternal care for rhesus isoimmunization
O361	Maternal care for other isoimmunization
O363	Maternal care for signs of fetal hypoxia
O364	Maternal care for intrauterine death
O365	Maternal care for poor fetal growth
O366	Maternal care for excessive fetal growth
O368	Maternal care for other specified fetal problems
O369	Maternal care for fetal problem, unspecified
O40X	Polyhydramnios
O410	Oligohydramnios

O418	Other specified disorders of amniotic fluid and membranes
O429	Premature rupture of membranes, unspecified
O438	Other placental disorders
O440	Placenta praevia specified as without haemorrhage
O441	Placenta praevia with haemorrhage
O459	Premature separation of placenta, unspecified
O468	Other antepartum haemorrhage
O469	Antepartum haemorrhage, unspecified
O470	False labour before 37 completed weeks of gestation
O471	False labour at or after 37 completed weeks of gestation
O479	False labour, unspecified
O48X	Prolonged pregnancy
O718	Other specified obstetric trauma
O882	Obstetric blood-clot embolism
Z321	Pregnancy confirmed
Z33X	Pregnant state, incidental
Z340	Supervision of normal first pregnancy
Z348	Supervision of other normal pregnancy
Z349	Supervision of normal pregnancy, unspecified
Z352	Supervision of pregnancy with other poor reproductive or obstetric history
Z353	Supervision of pregnancy with history of insufficient antenatal care
Z357	Supervision of high-risk pregnancy due to social problems
Z358	Supervision of other high-risk pregnancies
Z368	Other antenatal screening
Z369	Antenatal screening, unspecified

Supplementary Table 3. Rates and cumulative rates of vaccine uptake during pregnancy for all vaccinated women by month and age group

Age	18-24			25-29			30-39			40-50			All age groups		
	n	%	Cum %	n	%	Cum %	n	%	Cum %	n	%	Cum %	N	%	Cum %
Dec-20	22	2.0%	0.5%	51	2.3%	0.7%	75	1.7%	0.6%	<5	1.2%	0.5%	152	1.9%	0.6%
Jan-21	99	9.0%	2.6%	188	8.4%	3.2%	335	7.4%	3.4%	30	8.7%	4.0%	652	7.9%	3.2%
Feb-21	48	4.4%	3.6%	86	3.9%	4.4%	131	2.9%	4.5%	11	3.2%	5.3%	276	3.4%	4.3%
Mar-21	76	6.9%	5.3%	147	6.6%	6.3%	246	5.4%	6.5%	32	9.3%	9.0%	501	6.1%	6.3%
Apr-21	34	3.1%	6.0%	158	7.1%	8.5%	585	12.9%	11.3%	75	21.7%	17.7%	852	10.4%	9.7%
May-21	226	20.7%	10.8%	705	31.7%	17.9%	1469	32.4%	23.4%	74	21.4%	26.4%	2474	30.2%	19.5%
Jun-21	253	23.1%	16.3%	225	10.1%	20.9%	444	9.8%	27.1%	44	12.8%	31.5%	966	11.8%	23.4%
Jul-21	66	6.0%	17.7%	144	6.5%	22.9%	370	8.2%	30.1%	29	8.4%	34.9%	609	7.4%	25.8%
Aug-21	98	9.0%	19.8%	217	9.8%	25.8%	401	8.8%	33.4%	20	5.8%	37.2%	736	9.0%	28.7%
Sep-21	65	5.9%	21.2%	149	6.7%	27.8%	246	5.4%	35.4%	17	4.9%	39.2%	477	5.8%	30.6%
Oct-21	41	3.7%	22.0%	55	2.5%	28.5%	104	2.3%	36.3%	<5	0.9%	39.6%	203	2.5%	31.5%
Nov-21	22	2.0%	22.5%	32	1.4%	29.0%	51	1.1%	36.7%	<5	0.6%	39.8%	107	1.3%	31.9%
Dec-21	44	4.0%	23.5%	68	3.1%	29.9%	82	1.8%	37.4%	<5	1.2%	40.3%	198	2.4%	32.7%
Total	1094			2225			4539			345			8203		

Supplementary Table 4. Vaccine uptake by Ethnicity/WIMD quintile of deprivation of area of residence and age group

Age group	18-24			25-29			30-39			40-50		
	Vaccinated	All	%	Vaccinated	All	%	Vaccinated	All	%	Vaccinated	All	%
Ethnicity												
Asian	28	101	27.7%	92	269	34.2%	191	492	38.8%	20	40	50.0%
White	887	3623	24.5%	1763	5782	30.5%	3685	9482	38.9%	282	660	42.7%
Other	23	92	25.0%	52	153	34.0%	108	296	36.5%	11	30	36.7%
Mixed	13	60	21.7%	17	83	20.5%	42	163	25.8%	<5	10	30.0%
Black	7	54	13.0%	29	128	22.7%	61	226	27.0%	8	32	25.0%

Unknown	136	734	18.5%	268	1032	26.0%	454	1482	30.6%	23	87	26.4%
WIMD_Quintile_2019												
5 (Least deprived)	88	306	28.8%	332	903	36.8%	1024	2261	45.3%	80	156	51.3%
4th	141	506	27.9%	361	1110	32.5%	834	2034	41.0%	76	154	49.4%
3rd	197	733	26.9%	367	1254	29.3%	735	2034	36.1%	42	136	30.9%
2nd	251	1071	23.4%	447	1500	29.8%	743	2093	35.5%	53	131	40.5%
1 (Most deprived)	292	1582	18.5%	458	1828	25.1%	687	2257	30.4%	58	173	33.5%
NA	125	466	26.8%	256	852	30.0%	518	1462	35.4%	38	109	34.9%

Supplementary Table 5. Chi-square (*P* value) of COVID-19 vaccine uptake by pregnant women characteristics compared.

Log Rank	X2	P value	X2	P value	X2	P value	X2	P value	X2	P value	X2	P value
Age	18-24		25-29		30-39		40-50					
18-24	-	-	0.46	0.50	30.32	<.001	26.74	<.001				
25-29	-	-	-	-	42.73	<.001	26.32	<.001				
30-39	-	-	-	-	-	-	4.75	0.029				
40-50	-	-	-	-	-	-	-	-				
Ethnicity	Asian		White		Other		Mixed		Black		Unknown	
Asian	-	-	4.16	0.041	0.60	0.44	0.23	0.629	0.06	0.801	8.61	0.003
White	-	-	-	-	6.44	0.011	0.10	0.775	0.39	0.531	4.65	0.031
Other	-	-	-	-	-	-	0.76	0.385	0.42	0.519	11.17	0.001
Mixed	-	-	-	-	-	-	-	-	0.04	0.852	1.00	0.319
Black	-	-	-	-	-	-	-	-	-	-	1.97	0.161
Unknown	-	-	-	-	-	-	-	-	-	-	-	-
WIMD	1st		2nd		3rd		4th		5th		Unknown	
1 st	-	-	0.69	0.407	3.32	0.068	0.80	0.371	17.45	<.001	3.45	0.063

2nd	-	-	-	-	6.80	0.009	0.05	0.823	12.90	<.001	1.70	0.192
3rd	-	-	-	-	-	-	7.24	0.007	36.13	<.001	12.51	<.001
4th	-	-	-	-	-	-	-	-	12.24	<.001	1.43	0.232
5th	-	-	-	-	-	-	-	-	-	-	3.71	0.054
Unknown	-	-	-	-	-	-	-	-	-	-	-	-

Supplementary Table 6. Demographics for women completing the survey

		N	%
Age	18-24	21	6.3
	25-29	85	25.7
	30-39	147	44.4
	40-50	14	4.2
	Unknown	64	19.4
Ethnicity	White	272	82.2
	Non-White	5	1.5
	Unknown	54	16.3