Supplemental material

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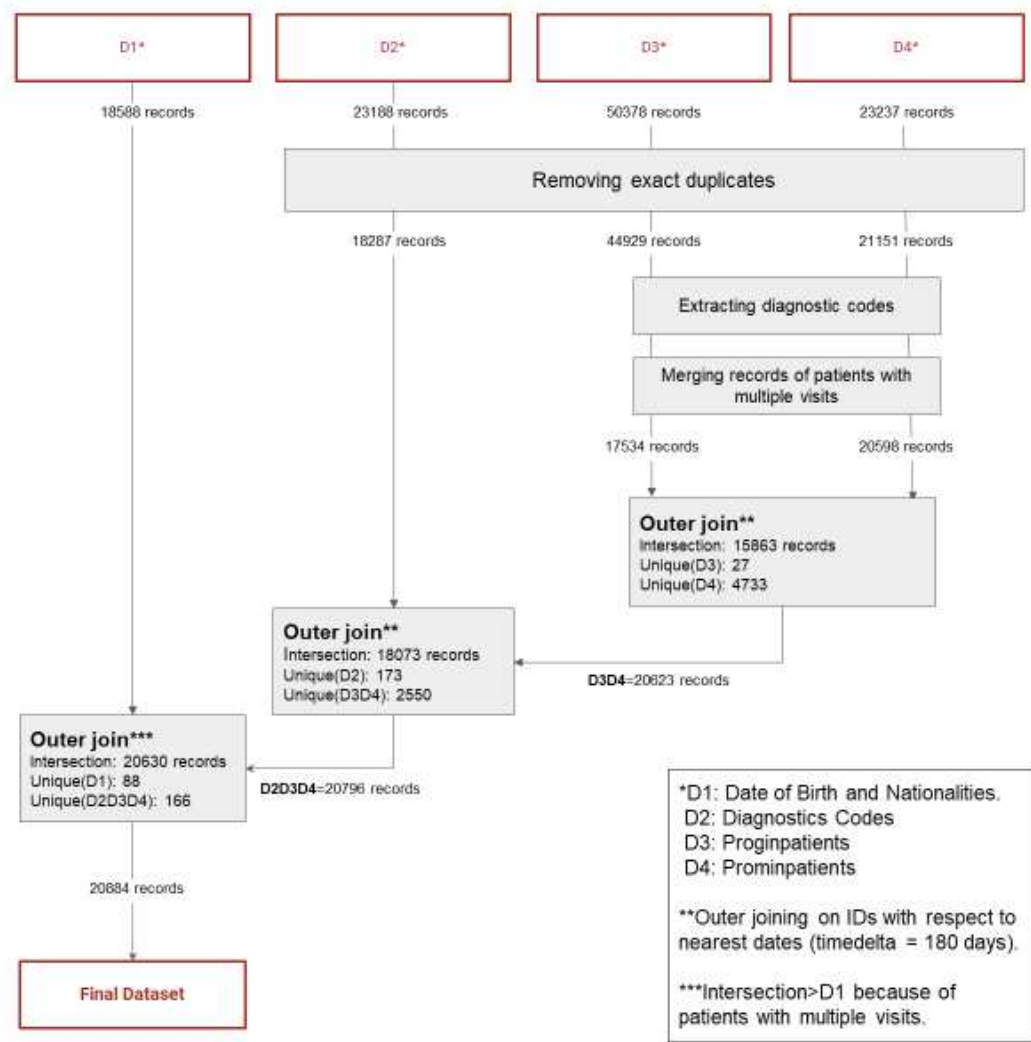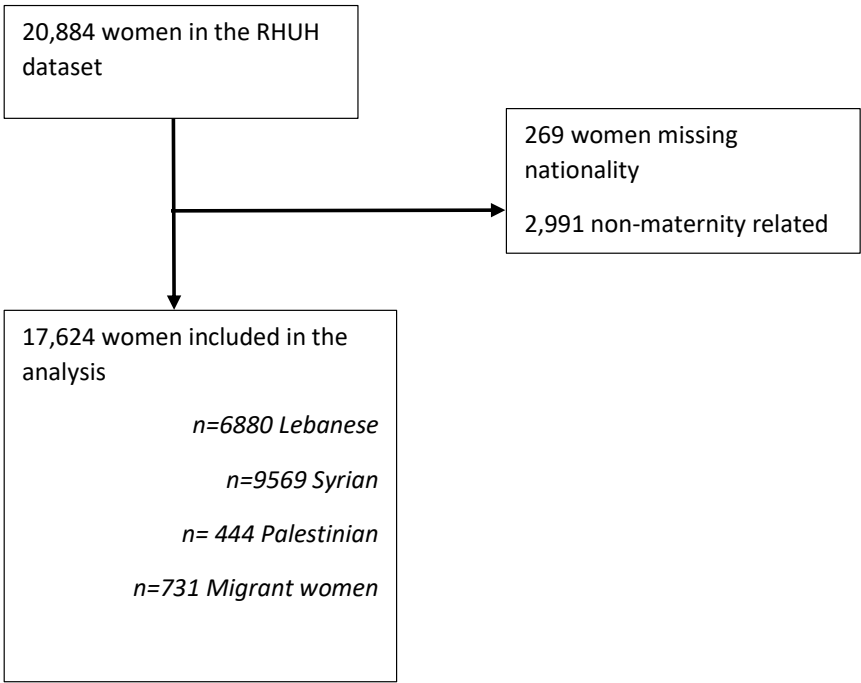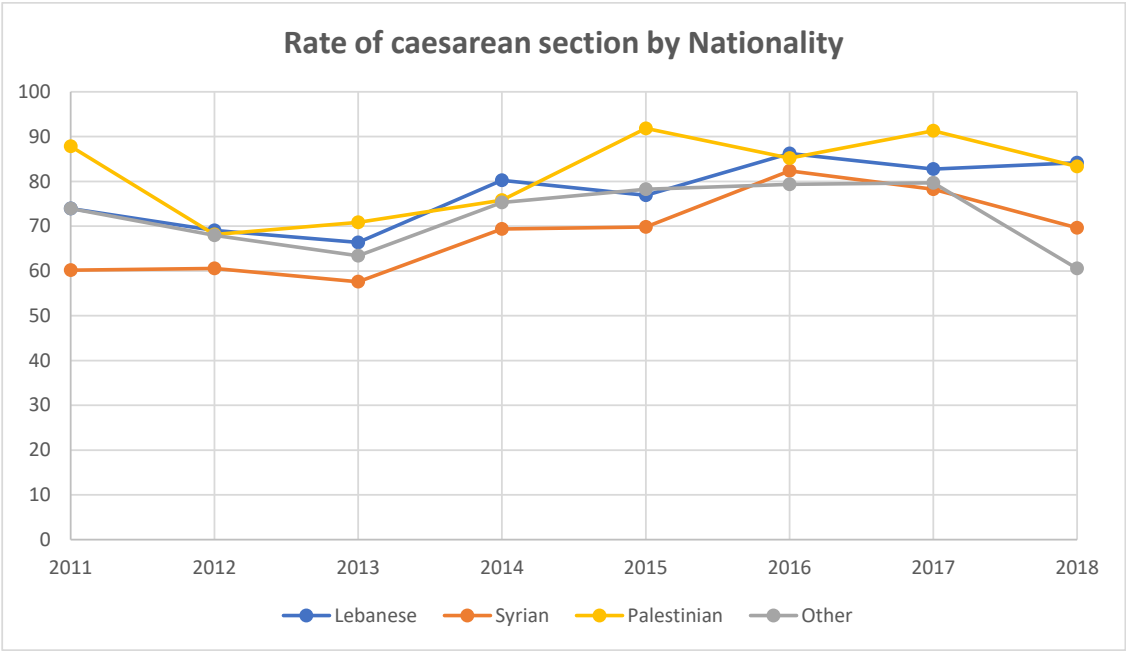placed on this supplemental material which has been supplied by the author(s)

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Supplementary figure1. Flow diagram of RHUH IT outputs into dataset for analysis.

Supplementary figure 2. Flow diagram of study population

20,884 women in the RHUH dataset

269 women missing nationality

2,991 non-maternity related

17,624 women included in the analysis

n=6880 Lebanese

n=9569 Syrian

n= 444 Palestinian

n=731 Migrant women

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Supplementary figure 3. Caesarean section rate at RHUH by nationality of women

Rate of caesarean section by Nationality

Legend: Lebanese, Syrian, Palestinian, Other

Supplementary Table 1. Machine learning model attributes for each variable

Column	Model	Vectorizer	Max features	Document Frequency Range	Weights	Accuracy	Precision	Recall	F1
Csection Number	Logistic Regression	Count	1000	1~99%	Balanced	0.99	0.99	0.99	0.99
Diabetes	Random Forest	Tfidf	800	1~90%	N/A	0.96	0.96	0.96	0.96
Episiotomy	Logistic Regression	Tfidf	2000	1~99%	Balanced	0.97	0.97	0.97	0.97
Gestational diabetes	Random Forest	Count	500	2~50%	N/A	0.9	0.9	0.9	0.89
Gestational age	Regex	N/A	N/A	N/A	N/A	0.84	0.91	0.84	0.86
Hypertension complication of pregnancy (2)	Logistic Regression	Tfidf	1000	10~90%	Balanced	0.97	0.97	0.97	0.96
Hypertension	Logistic Regression	Tfidf	500	5~70%	Balanced	0.96	0.96	0.96	0.96
Hysterectomy	Logistic Regression	Tfidf	800	1~99%	Balanced	0.97	0.97	0.97	0.97
Intrauterine fetal death	Logistic Regression	Tfidf	1000	5~70%	0:0.2,1:0.8	0.99	0.99	0.99	0.99
IUFD still birth	Logistic Regression	Tfidf	800	1~90%	N/A	0.99	0.99	0.99	0.99
Major complication of pregnancy (1)	Logistic Regression	Tfidf	1000	12~70%	Balanced	0.99	0.99	0.99	0.99
Parity	Regex	N/A	N/A	N/A	N/A	0.98	0.99	0.98	0.98
Previous number csection	Logistic Regression	Count	2000	1~99%	0:0.2	0.78	0.75	0.78	0.76
Smoking	LSTM	Keras preprocessing	50	N/A	N/A	0.93	0.94	0.93	0.93
Transfused blood	Logistic Regression	Tfidf	1000	10~99%	Balanced	0.96	0.96	0.96	0.96

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Supplementary Table 2. ICD-10 codes

ICD10 code	Disease	ICD10 code	Disease
O60	Preterm labor	O80.8	Other single spontaneous delivery
O60.0	Preterm labor without delivery	O80.9	Single spontaneous delivery, unspecified
O60.1	Preterm labor with preterm delivery	O81	Single delivery by forceps and vacuum extractor
O61	Failed induction of labor	O81.0	Low forceps delivery
O62.0	Primary inadequate contractions	O81.1	Mid-cavity forceps delivery
O62.2	Other uterine inertia	O81.3	Other and unspecified forceps delivery
O64.1	Obstructed labor due to breech presentation	O81.4	Vaccum extractor delivery
O66.1	Obstructed labor due to locked twins	O82	Single delivery by caesarean section
O68	Labor and delivery complicated by abnormality of fetal acid-base balance	O82.0	delivery by elective C-section
O69.0	Labour and delivery complicated by prolapse of cord	O82.1	delivery by emergency c-section
O71.1	Rupture of uterus during labor	O82.2	delivery by emergency c-section/hysterectomy
O71.3	Obstetric laceration of cervix	O82.8	Other single delivery by caesarean section
O71.4	Obstetric high vaginal laceration alone	O82.9	Delivery by caesarean section, unspecified
O71.9	Obstetric trauma, unspecified	O84	Multiple delivery
O72	Postpartum hemorrhage	O84.0	Multiple delivery, all spontaneous
O72.2	Delayed and secondary postpartum hemorrhage	O84.1	Multiple delivery, all by forceps and vacuum extractor
O73	Retained placenta and membranes, without hemorrhage	O84.2	Multiple delivery, all by caesarean section
O73.0	Retained placenta without hemorrhage	Z38.3	Twin, born in hospital

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O73.1	Retained portions of placenta and membranes, without hemorrhage
O75.7	Vaginal delivery following previous caesarean section
O80	Single spontaneous delivery
O80.0	Spontaneous vertex delivery
O80.1	Spontaneous breech delivery

Z37.3	Twins, one liveborn and one stillborn
Z37.1	Single stillbirth
Z37.4	Twins, both stillborn
Z37.2	Twins, both liveborn

Supplementary Table 3. Specific nationalities of the other nationality group

Nationality others breakdown	N	%
Egyptian	48	6.57
Ethiopian	200	27.36
Iraqi	50	6.84
Jordanian	25	3.42
Moroccan	13	1.78
Philippine	77	10.53
Sri Lankan	16	2.19
Sudanese	39	5.34
Turkish	22	3.01
Others	241	32.97
Total	731	100