

Search strategy

Main question:

What are the available prognostic models for adverse pregnancy outcomes in low and middle income countries and their performance?

Inclusion criteria:

- Development and/or validation of a prognostic model
- Prognostic model included at least 2 predictors or more
- Study undertaken in a low- or middle-income country
- Outcome focused on adverse pregnancy outcomes, both maternal and perinatal

Search string:

Determinant	Outcome	Domain
Prognostic model/prediction model	Adverse pregnancy outcomes/pregnancy complications [Mesh]	Low and middle income countries
Validat*	Pregnancy complications	Developing countries
Predict*	Abortion, spontaneous	Low resource
Rule*	Diabetes, gestational	Low resource setting
Outcome*	Fetal death	Limited resource
Risk*	Stillbirth	Constrained resource
Model*	Perinatal mortality	Restricted resource
History	Perinatal death	Delimited resource
Variable*	Fetal diseases	Low-income country
Criteria	Hypertension, pregnancy-induced	Low-income countries
Scor*	Eclampsia	Low resourced
Characteristic*	HELLP syndrome	Middle-income country
Finding*	Pre-eclampsia	Middle-income countries
Factor*	Obstetric labor complications	(Africa)
Deciscion*	Vacuum extraction, obstetrical	(Asia)
Identif*	Obstetrical forceps	(Caribbean)
Prognos*	Cesarean section	(West Indies)

Clinical*	Placenta Previa	(South America)
Logistic Models	Uterine cervical incompetence	(Latin America)
Prognostic	fetal membranes, premature rupture	(Central America)
Risk score	Obstetric labor, premature	
Prediction model	Premature birth	
Prediction rule	Hypertensive disorders of pregnancy	
Risk assessment	Maternal death	
algorithm	Post-partum haemorrhage	
Decision support techniques	Shoulder dystocia	
Algorithms	Manual placenta removal	
	Growth restrict*	
	Breach of membranes	
	Preterm labour	

Specific search strategy per electronic database

Pubmed: 880 (update: 73)

#1

((Validat* OR Predict*[ti] OR Rule*) OR (Predict* AND (Outcome* OR Risk*[tiab] OR Model*[tiab])) OR ((History OR Variable* OR Criteria OR Scor*[tiab] OR Characteristic* OR Finding* OR Factor*) AND (Predict* OR Model*[tiab] OR Decision* OR Identif* OR Prognos*)) OR (Decision* AND (Model*[tiab] OR Clinical* OR "Logistic Models"[Mesh])) OR (Prognostic AND (History OR Variable* OR Criteria OR Scor*[tiab] OR Characteristic* OR Finding* OR Factor* OR Model*[tiab])) OR "risk score"[tiab] OR "prediction model"[tiab] OR "prediction rule"[tiab] OR "risk assessment"[tiab] OR "algorithm"[tiab] OR "Decision Support Techniques"[Mesh] OR "Risk Assessment"[Mesh] OR "Algorithms"[Mesh])

#2

("pregnancy complications"[MeSH Terms] OR "abortion, spontaneous"[MeSH Terms] OR "diabetes, gestational"[MeSH Terms] OR "fetal death"[MeSH Terms] OR "stillbirth"[MeSH Terms] OR "perinatal mortality"[MeSH Terms] OR "perinatal death"[MeSH Terms] OR "fetal diseases"[MeSH Terms] OR "hypertension, pregnancy-induced"[MeSH Terms] OR "eclampsia"[MeSH Terms] OR "hellp syndrome"[MeSH Terms] OR "pre-eclampsia"[MeSH Terms] OR "obstetric labor complications"[MeSH Terms] OR "vacuum extraction, obstetrical"[MeSH Terms] OR "obstetrical forceps"[MeSH Terms] OR "cesarean section"[MeSH Terms] OR "diabetes, gestational"[MeSH Terms] OR "placenta previa"[MeSH Terms] OR "uterine cervical incompetence"[MeSH Terms] OR "fetal membranes, premature rupture"[MeSH Terms] OR "obstetric labor, premature"[MeSH Terms] OR "premature birth"[MeSH Terms] OR "Hypertensive Disorders of Pregnancy"[Title/Abstract] OR "Maternal Death"[Title/Abstract] OR "Post Partum Haemorrhage"[Title/Abstract] OR "Shoulder dystocia"[Title/Abstract] OR "Manual Placenta

Removal"[Title/Abstract] OR Growth restrict*[Title/Abstract] OR "Breach of membranes"[Title/Abstract] OR "Preterm labour"[Title/Abstract] OR stillbirth[Title/Abstract])

#3

("Developing countries"[MeSH] OR low resource[Title/Abstract] OR low resource setting[Title/Abstract] OR limited resource[Title/Abstract] OR constrained resource[Title/Abstract] OR restricted resource[Title/Abstract] OR delimited resource[Title/Abstract] OR restrained resource[Title/Abstract] OR low-income country[Title/Abstract] OR low-income countries[Title/Abstract] OR low resourced[Title/Abstract] OR middle-income country[Title/Abstract] OR middle-income countries [Title/Abstract])

#4

#1 AND #2 AND #3

Embase: 267 (update: 11)

#1

validat* OR predict* OR rule* OR (predict* AND (outcome* OR risk* OR model*)) OR ('history'/exp OR history OR variable* OR criteria OR scor* OR characteristic* OR finding* OR factor* AND (predict* OR model* OR decision* OR identif* OR prognos*)) OR (decision* AND (model* OR clinical* OR 'logistic models'/exp OR 'logistic models')) OR (prognostic AND ('history'/exp OR history OR variable* OR criteria OR scor* OR characteristic* OR finding* OR factor* OR model*)) OR 'risk score'/exp OR 'risk score' OR 'prediction model'/exp OR 'prediction model' OR 'prediction rule' OR 'algorithm'/exp OR 'algorithm' OR 'decision support techniques'/exp OR 'decision support techniques' OR 'risk assessment'/exp OR 'risk assessment' OR 'algorithms'/exp OR 'algorithms'

#2

'pregnancy complication' OR 'abortion' OR 'pregnancy diabetes mellitus' OR 'fetus death' OR 'fetus mortality' OR 'stillbirth' OR 'perinatal mortality' OR 'maternal hypertension' OR 'eclampsia and preeclampsia' OR 'prematurity' OR 'cesarean section' OR 'hellp syndrome' OR 'postpartum hemorrhage' OR 'labor complication' OR 'premature labor' OR 'membrane rupture' OR ('pregnancy complications' OR 'abortion, spontaneous' OR 'fetal death' OR 'stillbirth' OR 'perinatal mortality' OR 'perinatal death' OR 'fetal diseases' OR 'hypertension, pregnancy-induced' OR 'eclampsia' OR 'hellp syndrome' OR 'pre-eclampsia' OR 'obstetric labor complications' OR 'vacuum extraction, obstetrical' OR 'obstetrical forceps' OR 'cesarean section' OR 'diabetes, gestational' OR 'placenta previa' OR 'uterine cervical incompetence' OR 'fetal membranes, premature rupture' OR 'obstetric labor, premature' OR 'premature birth' OR 'hypertensive disorders of pregnancy' OR 'maternal death' OR 'post partum haemorrhage' OR 'shoulder dystocia' OR 'manual placenta removal' OR growth AND restrict*) OR 'breach of membranes' OR 'preterm labour'

#3

'developing countries' OR low AND resource OR low AND resource AND setting OR limited AND resource OR constrained AND resource OR restricted AND resource OR delimited AND resource OR restrained AND resource OR 'low income' AND country OR 'low income' AND countries OR low AND resourced OR 'middle income' AND country OR 'middle income' AND countries

#4

#1 and #2 and #3

Cochrane library:

Results: 1067 (update: 162)

#1

((Validat* or Predict* or Rule*) or (Predict* and (Outcome* or Risk* or Model*)) or ((History or Variable* or Criteria or Scor* or Characteristic* or Finding* or Factor*) and (Predict* or Model* or Decision* or Identif* or Prognos*)) or (Decision* and (Model* or Clinical* or "Logistic Models")) or (Prognostic and (History or Variable* or Criteria or Scor* or Characteristic* or Finding* or Factor* or Model*)) or "risk score" or "prediction model" or "prediction rule" or "risk assessment" or "algorithm" or "Decision Support Techniques" or "Risk Assessment" or "Algorithms")

#2

("pregnancy complications" or "abortion, spontaneous" or "diabetes, gestational" or "fetal death" or "stillbirth" or "perinatal mortality" or "perinatal death" or "fetal diseases" or "hypertension, pregnancy-induced" or "eclampsia" or "hellp syndrome" or "pre-eclampsia" or "obstetric labor complications" or "vacuum extraction, obstetrical" or "obstetrical forceps" or "cesarean section" or "diabetes, gestational" or "placenta previa" or "uterine cervical incompetence" or "fetal membranes, premature rupture" or "obstetric labor, premature" or "premature birth" or "Hypertensive Disorders of Pregnancy" or "Maternal Death" or "Post Partum Haemorrhage" or "Shoulder dystocia" or "Manual Placenta Removal" or Growth restrict* or "Breach of membranes" or "Preterm labour")

#3

("Developing countries" or low resource or low resource setting or limited resource or constrained resource or restricted resource or delimited resource or restrained resource or low-income country or low-income countries or low resourced or middle-income country or middle-income countries)

#4

{AND #1-#3}

Global health library: 425 (update: 16)

Filters: LILACS, WPRIM, WHOLIS, South America, Asia, Africa and Caribbean

(tw:(((Validat* OR Predict* OR Rule*) OR (Predict* AND (Outcome* OR Risk* OR Model*)) OR ((History OR Variable* OR Criteria OR Scor* OR Characteristic* OR Finding* OR Factor*) AND (Predict* OR Model* OR Decision* OR Identif* OR Prognos*)) OR (Decision* AND (Model* OR Clinical* OR "Logistic Models")) OR (Prognostic AND (History OR Variable* OR Criteria OR Scor* OR Characteristic* OR Finding* OR Factor* OR Model*)) OR "risk score" OR "prediction model" OR "prediction rule" OR "risk assessment" OR "algorithm" OR "Decision Support Techniques" OR "Risk Assessment" OR "Algorithms") AND ("pregnancy complications" OR "spontaneous abortion" OR "gestational diabetes" OR "fetal death" OR "stillbirth" OR "perinatal mortality" OR "perinatal death" OR "fetal diseases" OR "pregnancy-induced hypertension" OR "eclampsia" OR "hellp syndrome" OR "pre-eclampsia" OR "labor complications" OR "labour complications" OR "vacuum extraction" OR "obstetrical forceps" OR "cesarean section" OR "caesarean section" OR "gestational diabetes" OR "placenta previa" OR "uterine cervical incompetence" OR ("premature rupture" AND membranes) OR "premature labor" OR "premature labour" OR "premature birth" OR "Hypertensive Disorders of Pregnancy" OR "Maternal Death" OR "Post-Partum Haemorrhage" OR "PostPartum Haemorrhage" OR "Post-Partum Hemorrhage" OR "PostPartum Hemorrhage" OR "Shoulder dystocia" OR "Manual Placenta Removal" OR "Growth restriction" OR "Breach of membranes" OR "Preterm labour" OR "Pre-term labour" OR "Preterm labor" OR "Pre-term labor" OR stillbirth))))))

Outcome definition, as recommended by the WHO or uptodate.com

Outcome	Definition
Abortion, spontaneous	Termination of pregnancy from natural causes before 20 weeks of gestational age or less 500 g.
Diabetes, gestational	Diabetes that developed during pregnancy and is diagnosis conducted by the WHO criteria.
Fetal death	See stillbirth
Stillbirth	Baby born with no signs of life at or after 28 weeks of gestation
Perinatal mortality	Number of stillbirths and deaths in the first week of life
Perinatal death	See above
Fetal diseases	Diseases of anomalies in the fetus
Hypertension, pregnancy-induced	Hypertension without proteinuria or other signs/symptoms of preeclampsia-related end-organ dysfunction that develops after 20 weeks of gestation
Eclampsia	Development of grand mal seizures in a woman with preeclampsia in the absence of other neurologic conditions that could account for the seizure
HELLP syndrome	Combination of hemolysis, elevated liver enzymes and low platelets
Pre-eclampsia	Hypertension and proteinuria or hypertension and significant end-organ dysfunction with or without proteinuria after 20 weeks of gestation in a previously normotensive woman
Hypertensive disorders in pregnancy	See above
Obstetric labor complications	General
Vacuum extraction	Use of vacuum extraction to deliver newborn
Obstetrical forceps	Use of obstetrical forceps to deliver newborn
Cesarean section	Cesarean delivery of the newborn
Placenta Previa	Presence of placental tissue that extends over the internal cervical os
Uterine cervical incompetence	The inability of the uterine cervix to retain a pregnancy in the second trimester in the absence of clinical contractions, labor, or both
Fetal membranes, premature rupture	Membrane rupture before the onset of uterine contractions
Breach of membranes	See above
Obstetric labor, premature	Delivery before gestational age of 37 weeks
Premature birth	See above
Preterm labour	See above
Maternal death	Death as a result of pregnancy-related conditions
Post-partum haemorrhage	Estimated blood loss ≥ 500 mL after vaginal birth or ≥ 1000 mL after cesarean delivery
Shoulder dystocia	Obstruction of one of the fetal shoulders behind the symphysis pubis after delivery of the head.
Manual placenta removal	Manual removal of placenta if controlled cord traction or drugs are not effective

Growth restrict*

Fetus that has not reached its growth potential
because of genetic or environmental factors