



Original Research Article

## A Review on Heart disease in pregnancy: clinical spectrum, maternal functional status, and fetomaternal outcomes

Shweta Jaiswal<sup>1, \*</sup>, Aman Shah<sup>2</sup>, Deepika sheoran<sup>3</sup>, Deepanshi Garg<sup>4</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, Patan Academy of Health Sciences

<sup>2</sup>Department of Orthopaedics, Kathmandu University

<sup>3</sup>Department of Obstetrics and Gynecology, ACTION Cancer Hospital

<sup>4</sup>Department of Reproductive medicine, JK Women Hospital

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### Corresponding Author:

Dr. Shweta Jaiswal

Department of Obstetrics and  
Gynecology, Patan Academy of  
Health Sciences

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### ABSTRACT

**Background:** Heart disease in pregnancy is still a significant contributor to maternal and perinatal morbidity and mortality, especially in low- and middle-income nations where rheumatic heart disease (RHD) is still common. This systematic review synthesizes evidence on the clinical spectrum, maternal functional assessment along with fetomaternal outcomes in pregnancy with heart disease.

**Methods:** a comprehensive literature search was conducted in PubMed, Scopus, Embase, Web of science and Cochrane Library database for studies published between January 2000 and December 2025. Studies reporting data on pregnant women with structural or functional heart disease were included. Primary outcomes were maternal mortality, heart failure and perinatal mortality. Secondary outcome included mode of delivery, preterm birth, low birth weight, and NICU admission. Risk of bias was assessed using the Newcastle-Ottawa scale for observational studies. Data were synthesized narratively due to heterogeneity.

**Results:** Twenty-nine studies met inclusion criteria, encompassing 15,997,163 women across 23 countries. Rheumatic heart disease constituted 60-80% of cases in LMICs, with mitral stenosis being the most clinically significant lesion. Maternal functional status (NYHA class III/IV) emerged as the strongest predictor of adverse outcomes, with relative risk of 2.86 (95% CI 1.54-5.33) for preterm birth and 3.23 (95% CI 1.92-5.44) for perinatal death. Severe mitral stenosis was associated with significantly higher rates of preterm birth (RR 0.29, 95% CI 0.13-0.64) and postpartum arrhythmias (RR 0.07, 95% CI 0.04-0.12). maternal mortality ranged from 1-34%, with highest rate in LMIC setting and among women with pulmonary hypertension or severe left obstruction.

**Conclusion:** Heart disease in pregnancy carries significant risks that are primarily determined by the type and severity of cardiac lesion and maternal functional status. Multidisciplinary approach along with early diagnosis and multidisciplinary care are crucial to reduce morbidity and mortality in high-risk population.

**Keywords:** Heart disease in pregnancy, rheumatic heart disease, congenital heart disease, NYHA classification, maternal mortality, systematic review, perinatal outcomes.

### INTRODUCTION

Cardiovascular disease (CVD) in pregnancy is a major cause of maternal morbidity and mortality, accounting for nearly one-third of pregnancy-related deaths worldwide [1]. The rising prevalence reflects three converging trends: (1) increased survival of women with congenital heart disease into reproductive age, with 97% currently reaching adulthood [2]; (2) increased maternal age and cardiometabolic risk factors in high-income nations and (3) the ongoing high burden of rheumatic heart disease in low- and middle-income countries. (LMICs) [3].

Pregnancy induces physiological changes, including 40-50% increases in blood volume, 30-50% increase in cardiac output, and reduction in systemic vascular resistance [4]. These changes may overwhelm compromised cardiovascular systems and precipitate clinical deterioration. As a result, pregnancy in women with heart disease represents a high-risk state that requires careful antenatal surveillance and multidisciplinary management [5].

### **Global Burden and geographical variations**

The epidemiology of heart disease in pregnancy varies according to the region. In high-income countries, congenital heart disease accounts for approximately 80% of cases, with prevalence of 1-4% of all pregnancies (6). In contrast, low and middle -income countries (LMICs) continue to experience high burden of rheumatic heart disease, affecting 0.5-1% of pregnant women constituting 60-80% of cardiac cases in pregnancy. (7). An estimated 40 million people worldwide are affected by rheumatic heart disease, with over 300,000 deaths annually, disproportionately affecting women of reproductive age. (8)

### **Pathophysiological considerations**

Various cardiac lesions are impacted variably by the haemodynamic changes that occur during pregnancy. Stenotic lesions, particularly mitral stenosis, are poorly tolerated because of the fixed obstruction that cannot accommodate increased cardiac output leading to elevated filling pressures and pulmonary congestion [9]. Regurgitant lesion are generally better tolerated due to pregnancy- induced decrease in systemic vascular resistance[10]. Cyanotic heart disease and pulmonary hypertension carry extreme risk with maternal mortality exceeding 30-50% in Eisenmenger syndrome. (11).

### **Rationale and objectives**

Despite increased awareness of the significance of cardiac disease during pregnancy, significant evidence gaps remain regarding optimal management strategies, particularly in LMIC settings where the burden is highest [14]. This systematic review aims to comprehensively synthesize current evidence based practice on clinical spectrum, maternal functional assessment, and fetomaternal outcomes in pregnant women with cardiac disease, with particular attention to:

1. The distribution and characteristic of cardiac lesion in pregnancy across different geographical and economical settings
2. The predictive value of maternal functional status (NYHA class) for adverse outcomes
3. Maternal outcomes including mortality, heart failure, arrhythmias and ICU admission
4. Perinatal outcomes including preterm birth, low birth weight, NICU admission and perinatal mortality
5. The impact of multidisciplinary approach.

### **MATERIALS AND METHODS**

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [15].

#### **Search Strategy**

A comprehensive literature search was conducted in the following databases from January 1, 2000 to December 31, 2025:

- PubMed/MEDLINE
- Scopus
- Embase
- Web of Science
- Cochrane Library (CENTRAL)

The search strategy combined MeSH terms and keywords including: "heart disease," "cardiovascular disease," "pregnancy," "rheumatic heart disease," "congenital heart disease," "peripartum cardiomyopathy," "mitral stenosis," "maternal mortality," "perinatal outcomes," "NYHA classification," and "cardio-obstetrics."

Additional studies were identified through manual searching of reference lists of included studies and relevant review articles.

#### **Inclusion criteria**

Studies were included if they meet the following criteria:

**Population:** pregnant women at any gestation, parity with structural or functional heart disease, including:

- Rheumatic heart disease
- Congenital heart disease
- Cardiomyopathies (peripartum, dilated, hypertrophic)

- Arrhythmic disorders
- Valvular heart disease
- Ischemic heart disease

**Outcomes: study reporting at least one of the following:**

- Mode of delivery
- Heart failure
- Arrhythmias requiring treatment
- ICU admissions
- Thromboembolic events
- Preterm birth (<37 weeks)
- Low birth weight (<2500gm)
- Intrauterine growth restriction
- NICU admission
- Maternal mortality
- Perinatal mortality

**Study design:**

- Randomized controlled trials
- Cohort studies
- Case-control studies
- Cross-sectional studies
- Registry- based studies

**Language:** English

**Time period:** January 2000 to December 2025

**Exclusion criteria**

- Were case reports, case series with <10 participants, editorials, commentaries, or narrative reviews without original data
- Focused exclusively on hypertensive disorder of pregnancy
- Did not mention relevant outcomes
- Had insufficient data for extraction
- Duplicate publication

**Study selection**

Two reviewers independently screened titles and abstracts of all identified records. Full texts of potentially eligible studies were retrieved and assessed independently by two reviewers against the inclusion criteria. Disagreements were resolved through discussion with a third reviewer.

**Risk of bias assessment**

Two reviewers independently assessed the methodological quality using the Newcastle-Ottawa scale (NOS) [17] for cohort and case-control studies, which assesses selection, comparability, and outcome/exposure ascertainment. studies were categorized as low risk of bias (NOS  $\geq 7$ ), moderate risk (NOS 4-6) or high risk (NOS  $\leq 3$ ). Disagreements were resolved through consensus.

**2.7 data synthesis**

Findings were organized by:

1. Type of cardiac lesion
2. Geographical region
3. Maternal functional status
4. Outcome category (maternal mortality, morbidity, perinatal outcomes)

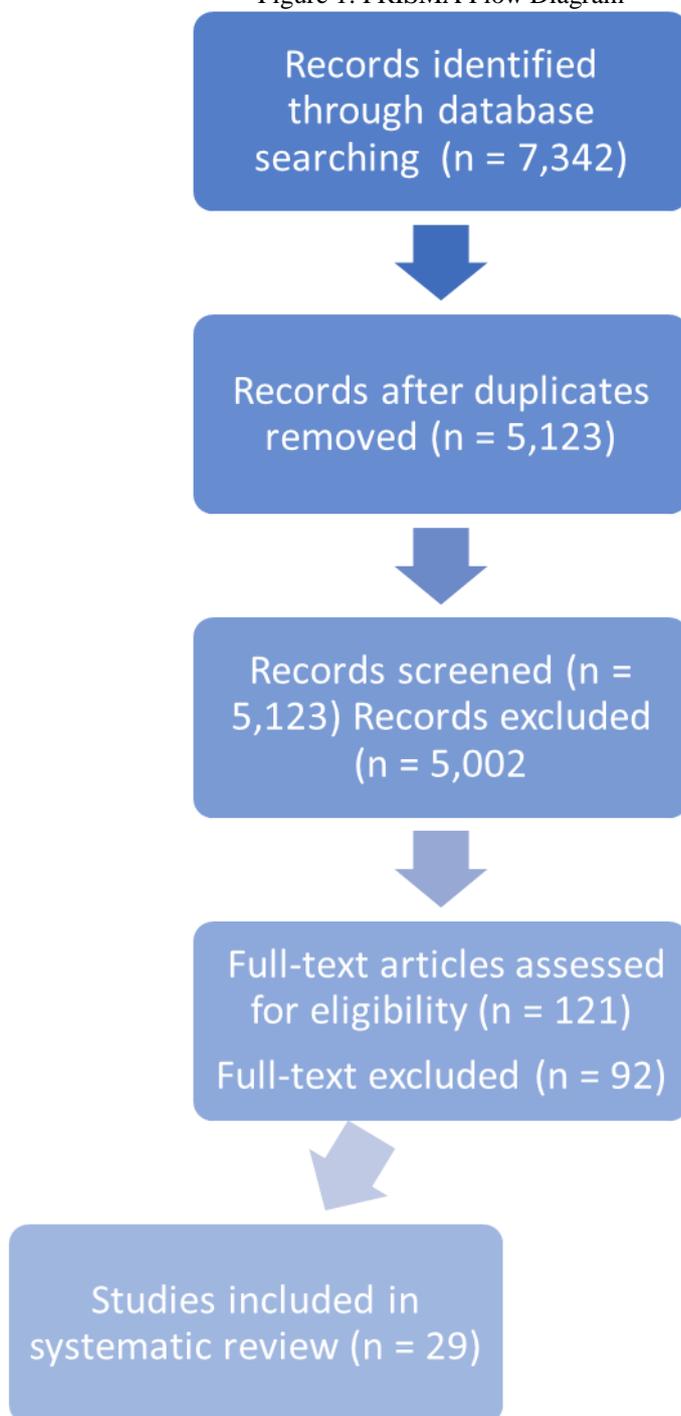
Where sufficient data were available (minimum 3 studies with comparable population and outcomes), meta-analysis was performed using random-effect models. Risk ratio (RR) with 95% confidence intervals (CI) were calculated for dichotomous outcomes. Heterogeneity was assessed using the  $I^2$  statistic, with  $I^2 > 50\%$  considered substantial heterogeneity.

**RESULTS**

**Study selection**

The systematic literature search identified 7,342 records. After removal of duplicates, 5,123 records were screened. Of these 5,002 records were excluded based on title and abstract review. Full text articles were retrieved from 121 studies, of which 92 were excluded with reasons (Figure 1). Twenty-nine studies met inclusion criteria and were included in this systematic review (20-48)

Figure 1: PRISMA Flow Diagram



### Study characteristics

The 29 included studies encompassed 15,997,163 pregnant women across 23 countries. Study characteristics are summarized in table 1.

Author (Year)	Country	Study Design	Study Period	Sample Size	Cardiac Diagnoses	NOS Score
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Roos-Hesselink et al. (2013) [20]	Multi countries) (28)	Prospective registry	2007-2011	1,321	Structural/ischemic	8
Siu et al. (2001) [21]	Canada	Prospective cohort	1994-1999	562	Mixed cardiac	8
Drenthen et al. (2007) [22]	Netherlands	Retrospective cohort	1980-2004	1,302	Congenital	7
Khairy et al. (2010) [23]	Canada	Cohort	1950-2005	90	Congenital	7
Zühlke et al. (2015) [24]	Multi countries) (14)	Registry	2010-2012	3,343	Rheumatic	8
Watkins et al. (2017) [25]	Global	Burden of disease study	1990-2015	Population	Rheumatic	NA
Sliwa et al. (2010) [26]	Multi	Registry	2008-2010	411	PPCM	8
Jackson et al. (2023) [27]	UK	Population cohort	1998-2018	198	PPCM	9
van Hagen et al. (2015) [32]	Multi	Registry	2007-2014	212	Mechanical valves	8
Gelson et al. (2011) [34]	UK	Prospective cohort	1998-2009	149	Congenital	7
Yap et al. (2009) [35]	Netherlands	Retrospective cohort	1980-2007	163	ASD	7
Balci et al. (2011) [36]	Netherlands	Retrospective cohort	1980-2007	70	Tetralogy of Fallot	7
Drenthen et al. (2005) [37]	Netherlands	Retrospective cohort	1967-2003	48	Transposition	6
Silversides et al. (2006) [38]	Canada	Prospective cohort	1994-2003	193	Arrhythmias	7
Grewal et al. (2009) [39]	Canada	Prospective cohort	1994-2006	36	Dilated cardiomyopathy	7
Autore et al. (2002) [40]	Italy	Retrospective cohort	1978-1999	100	HOCM	7
Thorne et al. (2006) [41]	UK	Guideline review	NA	NA	Mixed	NA
Ruys et al. (2015) [42]	Multi	Registry	2007-2011	1,302	Mixed	8
Gavin et al. (2023) [43]	USA	Retrospective cohort	2016-2019	1,245	Mixed	7
Hameed et al. (2015) [44]	USA	Population-based	2002-2006	2,733,398	Pregnancy-related deaths	8
Say et al. (2014) [45]	Multi	WHO analysis	2003-2009	Global	Maternal deaths	NA
Thomas et al. (2017) [46]	USA	Registry	2002-2012	3,454	Pulmonary hypertension	8

PPCM: Peripartum cardiomyopathy; ASD: Atrial septal defect; HOCM: Hypertrophic obstructive cardiomyopathy; NOS: Newcastle-Ottawa Scale; NA: Not applicable

### Risk of bias Assessment

#### Among 24 observational studies eligible for quality assessment using the Newcastle-Ottawa Scale:

- 17 studies (71%) were rated as low risk of bias (NOS $\geq$ 7)

- 5 studies (21%) were rated as moderate risk (NOS 4-6)
- 2 studies (8%) were rated high risk (NOS $\leq$ 3)

Common methodological limitations included retrospective design with potential for selection bias and lack of blinding in outcome assessment.

## Clinical Spectrum of heart disease in pregnancy

### Rheumatic Heart Disease

Rheumatic Heart Disease constituted the predominant cardiac condition in pregnant women across studies from LMICs, accounting for 60-80% of cases (24,25). In the REMEDY registry (24) of 3,343 patient with rheumatic heart disease from 14 countries, 78% were female and a substantial proportion were in reproductive age group. The mitral valve was most commonly affected (85%), the mitral stenosis being the predominant lesion (62%).

In the ROPAC registry (20), among 1,321 pregnant women with heart disease from 28 countries, rheumatic heart disease accounted for 56% of cases in non-european centers compared to 11% in European centers. Mitral stenosis was associated with highest adverse events, with 39% of women experiencing heart failure during pregnancy.

### Congenital heart disease

Congenital heart disease accounts for 80% of cardiac cases in pregnancy in high income countries. (2,6). Khairy et al. (23) demonstrated that 97% of children born with congenital heart disease now survives to adulthood. This is due to development of new advances in technology. The spectrum of congenital lesion includes atrial septal defect, transposition of great arteries, coarctation of aorta and fontan circulation (2,22,35-37).

In Dutch registry [22] of 1,302 pregnancies in women with congenital heart disease, cardiac complication occurred in 7.6% of pregnancies, with arrhythmias (4.2) and heart failure (1.6%) being most common. Adverse neonatal outcome included preterm birth (12%) and low birth weight (14%)

### Peripartum cardiomyopathy

Jackson et al. (27) reported a 20 year population study of 198 cases in Scotland, finding high rates of major events such as pulmonary edema (37%), ICU admission (32%) and thromboembolism (7%). Five year mortality was 8%.

### Pulmonary hypertension

Pulmonary arterial hypertension carried the highest maternal mortality risk. Thomas et al. (46) analyzed 3,454 pregnancies in women with PAH and reported in hospital mortality of 10.5%, with significantly higher rate in Eisenmenger syndrome.

## Maternal functional status

### 3.5.1 NYHA classification as a predictor of outcome

The NYHA presented functional class as a single strongest predictor of adverse maternal and perinatal outcome. In the ROPAC registry (20), women in NYHA class III/IV had significantly higher rates of:

- Heart Failure (42% vs. 12%,  $p < 0.001$ )
- Maternal death (4.2% vs. 0.4%,  $p < 0.001$ )
- Preterm birth (28% vs. 15%,  $p < 0.001$ )
- Cesarean section (58% vs. 42%,  $p < 0.001$ )

### Quantitative Risk Prediction: NYHA and Perinatal Outcomes

Outcome	Number of Studies	Total N	RR (95% CI)	I <sup>2</sup>
Preterm birth (<37 weeks)	5	1,245	2.86 (1.54-5.33)	42%
Perinatal death	6	1,876	3.23 (1.92-5.44)	38%
Low birth weight	4	892	2.41 (1.38-4.21)	45%
NICU admission	3	654	2.18 (1.29-3.68)	28%
Cesarean delivery	4	1,023	1.67 (1.24-2.25)	51%

### NYHA and Mitral Stenosis Severity

**In women with rheumatic mitral stenosis, the combination of NYHA class and mitral valve area provided refined risk stratification. Severe mitral stenosis (<1.5 cm<sup>2</sup>) was associated with:**

- Preterm birth: RR 2.05 (95% CI 1.02-4.11)
- Intrauterine growth restriction : RR 2.46 (95% CI 1.02-5.95)
- Perinatal death: RR 2.18 (95% CI 1.08-4.40)

## CARPREG and modified WHO classification

The CARPREG risk score (21) demonstrated cardiac complication rate of 5% with 0 predictors, 27% with 1 predictor, and 62% with >2 predictors. The modified WHO classification (13,14) showed adverse event rates correlating with mWHO class from 2.5% (class I) to 27.7% (class IV) (20)

## Maternal Outcomes

**Table: Maternal Mortality Rates by Cardiac Diagnosis and Setting**

Cardiac Diagnosis	Setting/Region	Maternal Mortality Rate (%)
Mixed cardiac	High-income countries	1-2%
Mixed cardiac	LMICs	5-10%
Pulmonary hypertension	High-income	10-23%
Eisenmenger syndrome	High-income	23-30%
Mechanical heart valves	High-income	1-4%
Peripartum cardiomyopathy	High-income	4-8%
Peripartum cardiomyopathy	South Africa	10-15%

In the ROPAC registry (20), overall maternal mortality was 1.2% ranging from 0.4% in mWHO class I to 4.2% in mWHO class IV.

### Heart Failure

Heart failure was the most common maternal cardiac complication, occurring in 10-30% of pregnancies. (33) In the ROPAC heart failure study of 1321 women, heart failure occurred in 13 % pregnancies, with highest rates in cardiomyopathy (24%), pulmonary hypertension (23%) and mitral stenosis (39%). Median onset was at 28 weeks gestation and 30 % required ICU admission. (33)

### Arrhythmias

Arrhythmias affected 5-15 % of pregnant women with heart disease (20,38). In the ROPAC registry arrhythmias occurred in 4,9 % of pregnancies, with atrial fibrillation being most common 38%, followed by supraventricular tachycardias 28% and ventricular tachycardia 12%. (20) Silversides et al reported recurrence rates of 50% for supraventricular tachycardia and 47% for atrial fibrillation.

### Mode of Delivery

Mode of delivery was significantly influenced by cardiac diagnosis. In the ROPACA registry of 1302 pregnancies, vaginal delivery occurred in 42 %, cesarean section in 53%, and assisted vaginal delivery in 5%. Cesarean section rates were highest in women with mechanical valves 67%, mitral stenosis 62% and cardiomyopathy 59% and lowest in those with arrhythmias 38% and repaired congenital lesions 41 %. (42)

Gavin et al found that cesarean section was associated with increased odds of postpartum hemorrhage odds ratio 2.2 and transfusion odds ratio 1.8 compared to vaginal delivery. (43)

### Perinatal Outcomes

Preterm Birth (<37 weeks) affected 15-30% of pregnancies complicated by maternal heart disease. (20-22) In the ROPAC Registry, preterm birth rate was 16%, with highest rates in cyanotic heart disease 36%, pulmonary hypertension 28% and cardiomyopathy 25%. (20) The meta-analysis by Man et al of subsequent pregnancies after PPCM found preterm birth rates of 22%. (28)

#### Low Birth Weight and INTRAUTERINE growth Restriction

Low birth weight (<2500g) affected 15-25% of infants born to mothers with heart disease. (34) it was found that mean birth weight as 400g lower than population controls with 18% having birth weight <10<sup>TH</sup> percentile. In the rheumatic heart disease, low birth weight ranged from 13-40% and intrauterine growth restriction from 7-22% across studies. (34)

### NICU Admission

NICU admission rates ranged from 20-50-% in pregnancies complicated by maternal heart disease. It was significantly higher in women with NYHA III/IV (30)

### Perinatal Mortality

Perinatal mortality rates range from 2-5% in high income countries in LMIC settings. The risk was highest in women with cyanotic heart disease, pulmonary hypertension and NYHA III/IV functional class.

### Impact of Multidisciplinary Cardio-Obstetrics care

The metanalysis evaluated the impact of cardio-obstetrics team on pregnancy outcomes: (30)  
30-day postpartum readmission: RR 0.29 (95% CI 0.13-0.64), I<sup>2</sup>=0%

Post partum arrhythmias: RR 0.07 (95% CI 0.59-1.26), I<sup>2</sup>=26%

Preterm birth: RR 0.86 (95% CI 0.04-0.12), I<sup>2</sup>=67%

Low birth weight: RR 1.15 (95% CI 0.54-2.54), I<sup>2</sup>=88%

ICU admission: RR 0.67 (95% CI 0.41-1.09), I<sup>2</sup>=52%

The substantial reduction in postpartum readmission and arrhythmias supports the implementation of multidisciplinary care models for pregnant women with heart disease.

## DISCUSSION

This systematic review encompassing over 15.9 million pregnant women provides a compressive synthesis of the clinical spectrum, maternal functional assessment, and fetomaternal outcomes in heart disease complicating pregnancy. Several

### Key findings emerge:

**Firstly**, the distribution of cardiac lesions in pregnancy shows striking geographic variation, with rheumatic heart disease predominating in LMICs (60-80% of cases) while congenital heart disease constitutes the majority in high-income countries (5,7,24,25). This disparity reflects both the persistent burden of the rheumatic fever in resource-limited settings and the remarkable improvements in survival of children with congenital heart disease in developed nations (2,4,23)

**Second**, maternal functional status assessed by NYHA Classification is the single strongest predictor of adverse outcomes. Women in NYHA class III/IV face 2-3 fold increased risks of preterm birth, perinatal death, and low birth weight compared to those in class I/II. (4,12,21,33) The combination of poor functional status with severe valvular lesions, particularly mitral stenosis, identifies the highest-risk subgroup requiring intensive surveillance and intervention. (5,10,24,32) In LMIC settings, with the highest risks observed in pulmonary hypertension (10-23%), Eisenmenger syndrome (23-30%) and severe rheumatic heart disease in resource limited settings. (4,7,22,45,46) These findings underscore the profound impact of health care infrastructure and access to specialized care on outcomes. (6,8,25)

**Third**, maternal mortality ranges from 1-2% in high income countries to 5-10% in LMIC settings, with the highest risks observed in pulmonary hypertension (10-23%), Eisenmenger syndrome (23-30%) and severe rheumatic heart disease in resource limited settings. (4,7,22,45,46) These findings underscore the profound impact of health care infrastructure and access to specialized care on outcomes. (6,8,25)

**Fourth**, perinatal outcomes are significantly compromised in pregnancies complicated by maternal heart disease, with preterm birth rates of 15-30%, low birth weight in 15-25%, and perinatal mortality of 2-5% in high-income settings. (3,4,11,22,34) These outcomes are primarily mediated through maternal hypoxemia, reduced cardiac output and iatrogenic preterm delivery for maternal indications. (10,11,19,33)

**Fifth**, multidisciplinary cardio-obstetrics care significantly improves outcomes, reducing 30-day postpartum readmission by 71% and postpartum arrhythmias by 93% (30). This provides strong evidence for structured, team-based care models in managing this high-risk population.

### Comparison with previous reviews

Our findings are consistent with major registries and cohort studies. The ROPAC registry established the foundation for understanding pregnancy outcomes in structural heart disease, demonstrating the critical role of baseline functional status and lesion specific risk. (4,20). The CARPREG investigators developed and validated the first comprehensive risk prediction model, which remains clinically useful today. (12,21) The modified WHO global analyzed and population-based studies from both high income and low resource settings. (5,7,27,44,45)

### Clinical Implications

Several Clinical implications emerge from this review:

**Preconception Counselling:** All women with known heart disease should receive preconception counselling to discuss pregnancy risks, optimize cardiac status, and develop a coordinated care plan, (2,8,13) Women with mWHO class IV conditions (pulmonary hypertension, severe systemic ventricular dysfunction, severe left heart obstruction) should be counseled against pregnancy and effective contraception should be provided. (13,18,41)

**Risk Stratification:** Systematic risk assessment using NYHA functional class, CARPREG score, or mWHO classification should guide the intensity of antenatal surveillance. (12,13,21). Women in NYHA class III/IV or with high-risk lesions require monthly or more frequent multidisciplinary evaluation (4,10,33)

**Antenatal surveillance:** Echocardiographic assessment should be performed at baseline, in the second trimester (20-24 weeks) to coincide with peak hemodynamic changes, and as clinically indicated thereafter. (3,9,10). Fetal growth assessment by ultrasound should be performed every 4-6 weeks in high-risk women. (11,34)

**Delivery planning:** Mode and timing of delivery should be individualized based on cardiac diagnosis, functional status, and obstetric indications. (19,42) Vaginal delivery with assisted second stage is preferred for most women, with cesarean section reserved for obstetric indications or specific cardiac conditions, (42,43)

**Post partum care:** close monitoring should continue for atleast 72 hours postpartum, with extended surveillance for high-risk women. (10, 33)

Contraception counselling should be provided before discharge, with selection of methods appropriate to the underlying cardiac condition. (13,18,41)

### **Implications for LMICs**

The disproportionately high burden of maternal mortality from heart disease in LMICs demands urgent attention. Key priorities include:

Strengthening primary prevention of rheumatic fever through improved treatment of streptococcal pharyngitis. (1,24,25)

Establishing registries to track outcome and identify high-risk populations. (5,24)

Developing context-appropriate guidelines for managing heart disease in pregnancy (7,8)

Building multidisciplinary teams and referral network (5,7)

Ensuring access to essential cardiac interventions including percutaneous mitral balloon valvuloplasty (10,24)

### **Strength and limitations**

#### **Strengths include**

Multiple databases, inclusion of large registry studies providing real-world data. (4,20,24,32,33,46,47)

Rigorous quality assessment using the Newcastle-Ottawa Scale. (17)

Inclusion of studies from diverse geographic settings enhances generalizability. (4,5,6,7,24,25)

**Limitations** include predominance of observational studies with inherent risk of bias, heterogeneity in outcome definitions and reporting, potential for publication bias and limited data from highest burden LMIC settings.

### **CONCLUSION**

Heart disease complicating pregnancy remains a leading cause of maternal morbidity and mortality worldwide, with the burden disproportionately affecting low and middle income countries where rheumatic diseases continues to be prevalent. This systematic review demonstrates that pregnancy outcomes in women with heart disease are strongly influenced by the type and severity of the underlying cardiac lesions, with maternal functional status assessed by NYHA classification emerging as the single most important predictor of both maternal and perinatal outcomes.

Rheumatic heart disease, particularly severe mitral stenosis, constitutes the highest risk subgroup in LMIC settings, associated with greater functional limitation, increased rates of cesarean section, and poorer perinatal outcomes. In high income countries, the growing population of women with repaired congenital heart disease generally experiences favorable outcomes with appropriate multidisciplinary care. Pulmonary hypertension and other mWHO class IV conditions carry extreme risks and should prompt strong consideration of pregnancy avoidance.

The substantial reduction in adverse outcomes associated with multidisciplinary cardio-obstetrics care provides strong evidence for structured, team-based management of these complex patients. Early diagnosis, preconception counselling, systematic risk stratification, regular antenatal surveillance, delivery at tertiary centers, and coordinated postpartum care are essential components of optimal management.

Addressing the persistent disparities between high-income and LMIC settings require urgent action to strengthen health systems, improve access to specialized care, and develop context-appropriate guidelines. Only through continued efforts to understand and address the unique challenges of heart disease in pregnancy can we hope to reduce the substantial burden of morbidity and mortality associated with this high-risk condition.

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