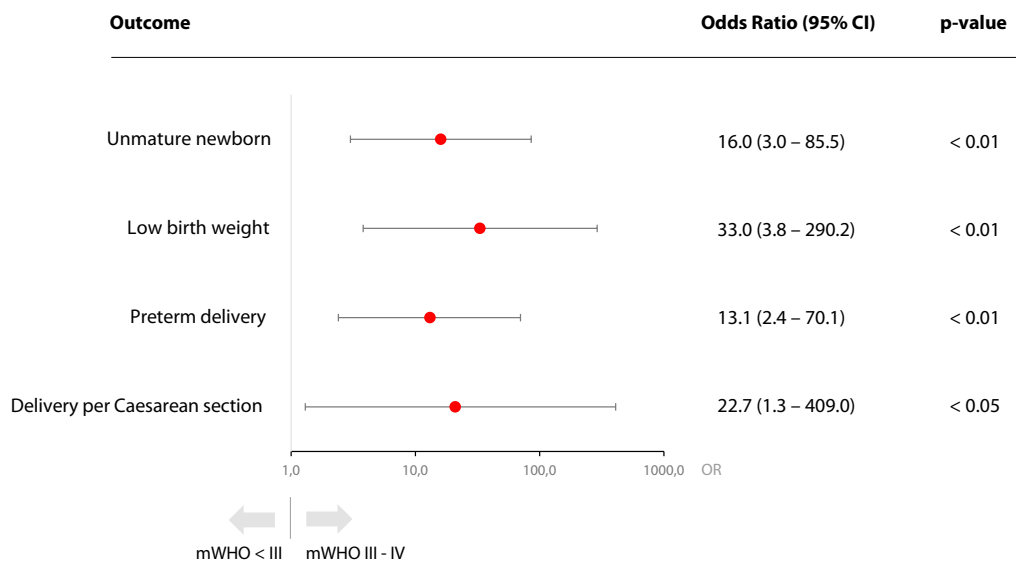


Fig. 1. Odds ratios (OR) of selected obstetric and neonatal outcomes of pregnancies

the deliveries. At the same time, all indications for the delivery per C.s. were declared as cardiac. The striking discrepancy in mWHO < III classes (64% vs 0%) probably reflects the concern of the attending physicians that these patients are also too risky and that operative delivery is the best solution. According to the ESC guidelines, planned delivery per C.s. in them has no maternal benefit and leads to earlier termination of pregnancy and lower birth weight (1), which fully corresponds to our results. An unfavorable phenomenon in Slovakia is steadily increasing trend to terminate pregnancy in women with heart disease per C.s.

When comparing the classes mWHO III-IV and mWHO < III, we found the most pronounced differences in **neonatal complications**. Newborns of mothers with high to extremely high risk had a significantly lower birth weight. The prevalence of newborns with low birth weight as well as the prevalence of preterm deliveries were significantly higher. We observed worse results in these parameters than in the ROPAC registry (3). The prevalence of low birth weight and preterm deliveries was equally 20.4% in our total cohort (vs 11.7% and 15.8% in ROPAC, respectively). In the ROPAC registry, congenital heart disease (CHD) was associated with spontaneous preterm birth (OR [odds ratio] = 1.8, 95% CI [confidence interval] = 1.2-2.7). Complex CHD was associated with small-for-gestational-age neonates (OR = 2.3, 95% CI = 1.5-3.5). Jastrow et al. reported preterm delivery in 16.7% of 312 pregnancies in women with heart disease (4). Toprak et al. found an identical finding as in our group – a significantly higher prevalence of preterm deliveries in women with CHD and mWHO classes III-IV than in mWHO classes I-II (5). Also in the Mexican group (399 births) the association between mWHO class and preterm deliveries was confirmed (6). Suwanrath et al. analysed 331 cases of pregnant women with heart disease. Adverse fetal outcomes including preterm delivery, low birth weight, small for gestational age and neonatal intensive care unit admission were significantly increased in mWHO classes III and IV. They concluded that the mWHO classification is useful not only for obtaining a cardiovascular

risk assessment in pregnant women with heart disease but also for predicting adverse fetal outcomes (7).

Neonatal mortality did not occur in our cohort. In the ROPAC registry, foetal mortality occurred in 1.7% and neonatal mortality in 0.6%, both higher than in the normal population (8). Italian authors reported the single-center experience in 51 pregnancies of women with cardiovascular disease. There was no neonatal mortality, just like in our study group (9).

The proportion of extremely high-risk pregnancies in the mWHO class IV is generally increasing. It was only 0.7% in the ROPAC registry in the years 2007-2010, but already 10.9% in the years 2015-2018 (3). Analogously, in our group (years 2011-2022), 12.5% of pregnant women were in mWHO class IV. These mothers have an extremely high risk of maternal mortality or severe morbidity (40-100%). According to the ESC guidelines, pregnancy is contraindicated for them, and if it occurs, its termination should be considered (1). Even for women in mWHO class III, the risk is high: 19-27% (1). Nevertheless, in our experience, most pregnancies in mWHO classes III-IV were intentional and not accidental.

According to the ESC guidelines all women in mWHO classes III-IV should be monitored throughout the pregnancy in expert centers for pregnancy and cardiac disease. The deliveries are also to be carried out in these centers (1). Significantly worse obstetric and neonatal outcomes in mWHO III-IV classes found in our study are in accordance with this statement. For pregnant women with cardiac diseases in mWHO classes < III, follow-up and delivery can be performed in local or referral hospitals (1).

The mWHO classification is designed to predict maternal risk. van Hagen et al. evaluated the potential of the mWHO classification for the prediction of obstetric and fetal complications in women with structural heart disease. There were 2742 pregnancies. The mWHO classification performed poorly in predicting obstetric (c-statistic = 0.60) and fetal events (c-statistic = 0.56) (10).