

# Fetal Fraction Amplification Yields Sufficient Fetal Fraction to Enable cfDNA Screening with a Low Screen-Failure Rate Between 8-10 Weeks Gestation



D. Claire Miller, MS; Jhett Bordwell, PhD; Jack Roach, MS; Seyedmehdi Shojaee, PhD; Summer Pierson, MS, CGC; Catherine Wicklund, MS, CGC; Katherine Johansen Taber, PhD; Dale Muzzey, PhD  
 1. Myriad Genetics, Salt Lake City, Utah

## Background

- In November of 2024, prenatal cell-free DNA (pcfDNA) screening became available beginning at 8 weeks gestation via a whole genome sequencing (WGS) assay that utilizes fetal fraction amplification (FFA)
- Here, we report on the laboratory experience with pcfDNA screening with FFA between 8w0d and 9w6d gestation for samples received in the first year following availability

## Methods

- Data from pcfDNA screens ordered between 11/19/2024 and 07/21/2025 were considered for analysis
- Number of orders received, screen-positive results, and screen failures were calculated
- Fetal fraction (FF) medians and first and third quartiles (Q1, Q3) for the 8- and 9-week gestational age period were calculated
- Where provided, body mass index (BMI) information was analyzed

Table 1. Screen Positive Result Type

Result Type	<sup>a</sup> 702 screen positive reports (2.47% screen positive rate)
<b>Aneuploidies, n (%)</b>	
Trisomy 21	140 (19.9)
Trisomy 18	39 (5.6)
Trisomy 13	48 (6.8)
Sex chromosome aneuploidy	234 (33.3)
<sup>b</sup> Rare autosomal aneuploidy	292 (41.6)
<b>Microdeletions, n (%)</b>	
22q11.2	8 (1.1)
1p36	4 (0.6)
15q11.2	3 (0.4)
5p	4 (0.6)
4p	2 (0.3)

<sup>a</sup>25 reports had >1 screen positive result <sup>b</sup>250 are trisomies

## Results

- During the study period, 28,446 orders were placed for patients between 8w0d and 9w6d
- 702 were screen-positive, for a screen-positive rate of 2.47% (Table 1)
- Screen-positives included 140 trisomy 21, 48 trisomy 13, 39 trisomy 18, 234 sex chromosome aneuploidies, 292 other autosomal aneuploidies, eight 1p36 microdeletions, four 22q11.2 microdeletions, three 15q11.2 microdeletions, two 4p deletions and four 5p microdeletions (Table 1)
- 19 samples (0.07%) failed due to insufficient FF (Figure 1)
- Median FF across the cohort was 15.4% (Q1=11.4%; Q3=20.2%) (Figure 2)
- For samples in which BMI could be assessed (n = 17,595), the proportion at BMI ≥30 was 35.5% (n = 6,246)
- Median FF was 12.5% (Q1=9.3%; Q3=16.1%) in samples with BMI ≥30 (Figure 3)

Figure 1. Screen failure reporting

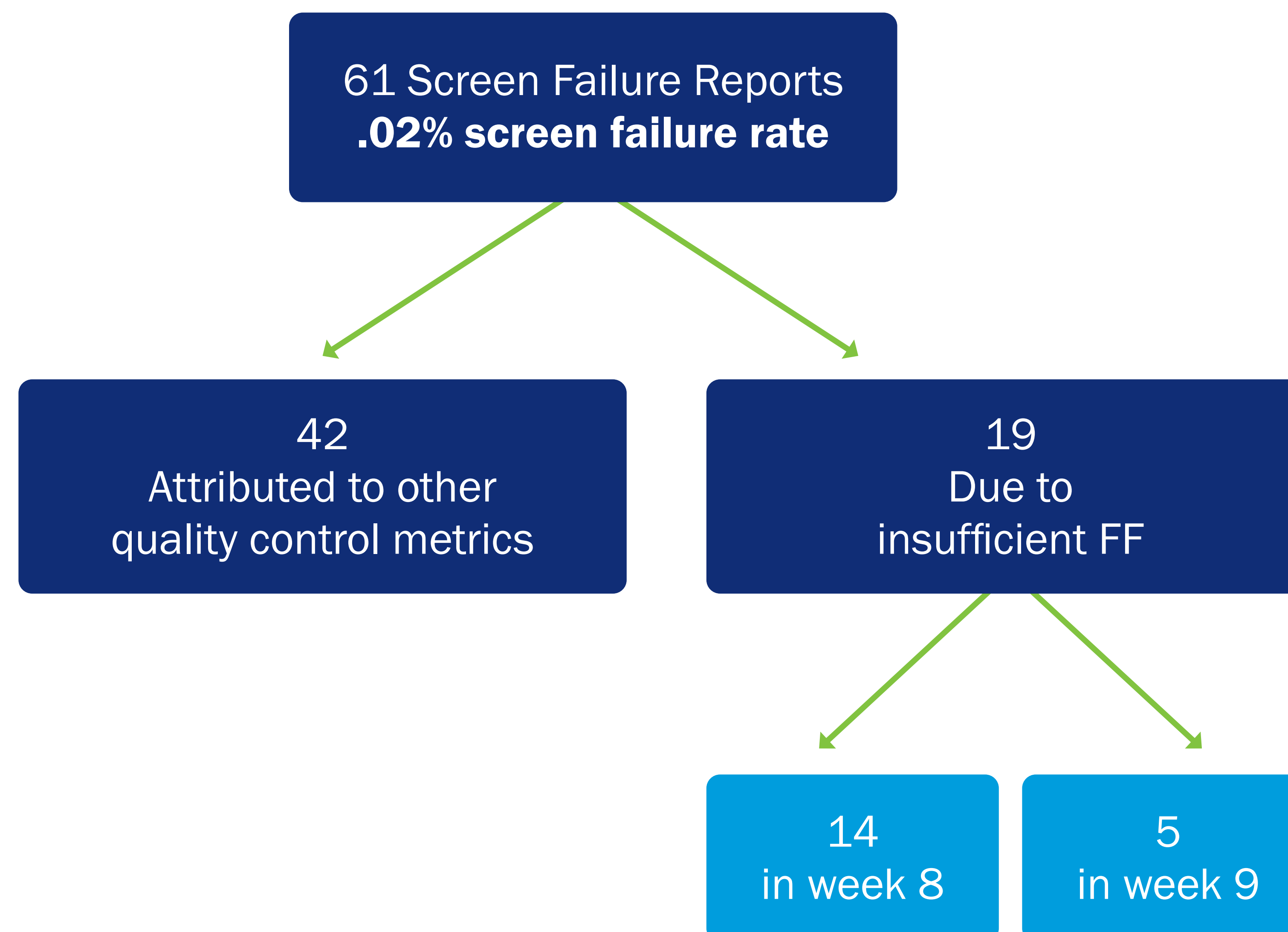


Figure 2. Fetal fraction distributions by week (n=28,446)

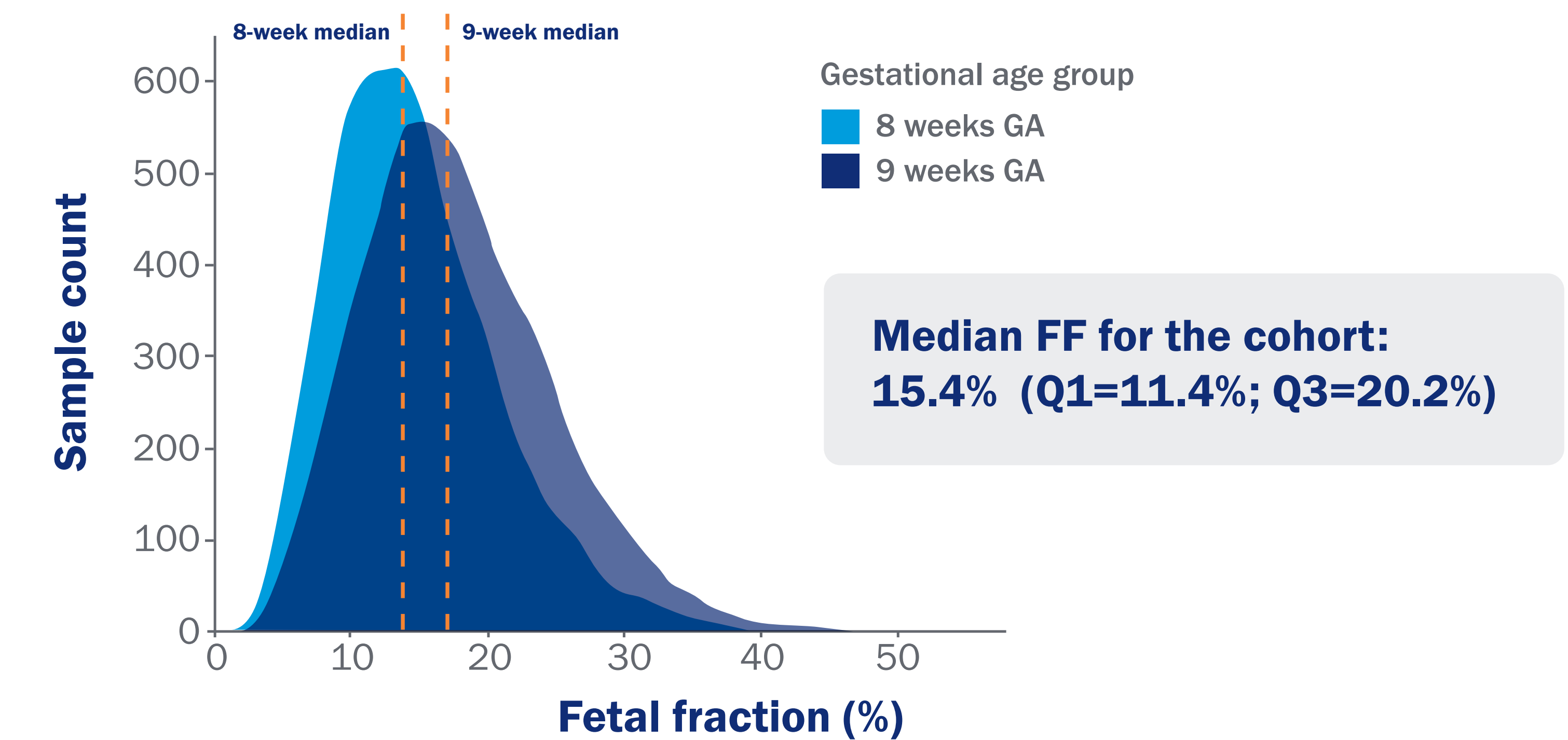
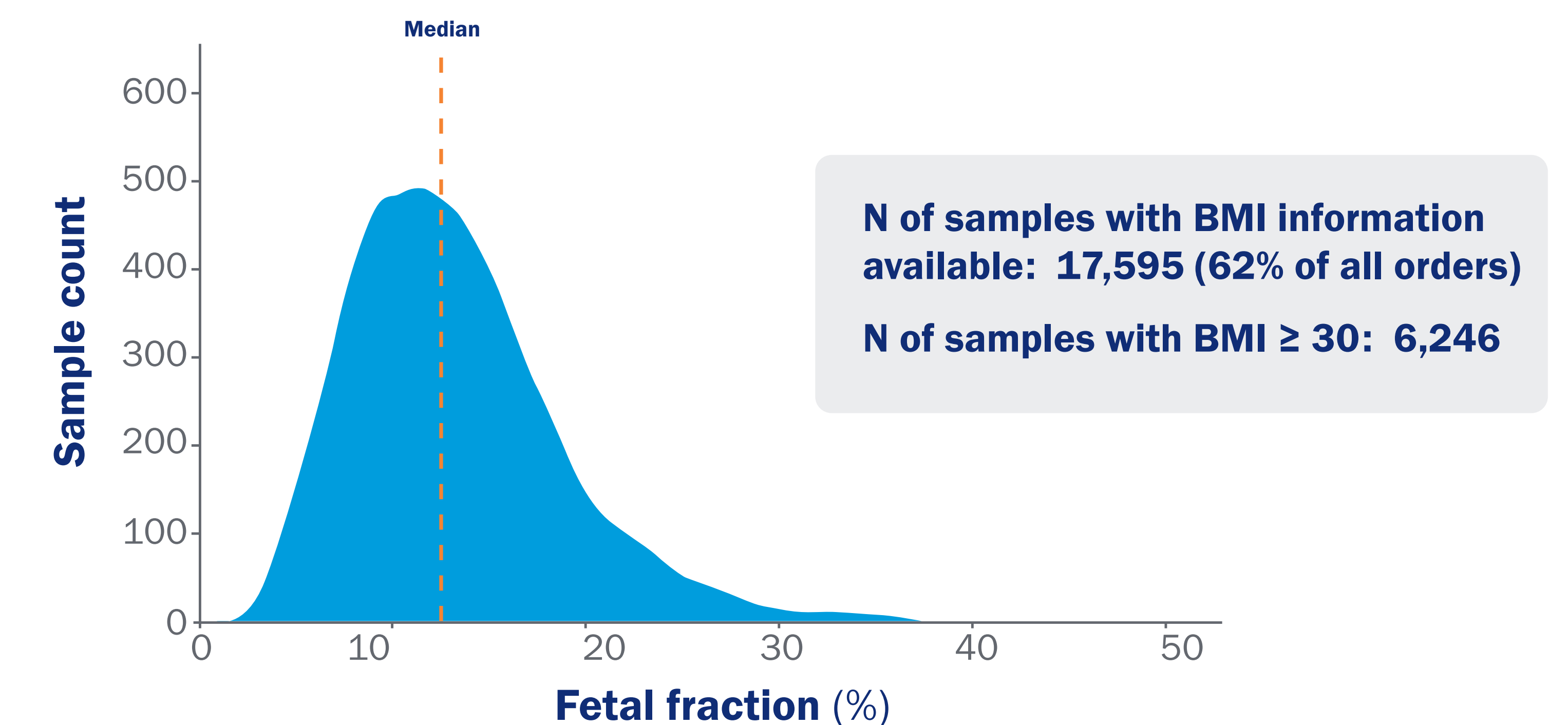


Figure 3. Fetal fraction distribution for high BMI samples (n=6,246)



## Conclusions

- Laboratory experience with cfDNA screening for pregnancies between 8-10 weeks gestation demonstrated sufficient FF for analysis while maintaining a low screen-failure rate across a broad population that included patients with high BMI.
- Screening at earlier gestational ages using this technology can provide more time for shared decision making in pregnancy management.