

INTRODUCTION

- International guidelines such as American College of Medical Genetics and Genomics (ACMG) recommend the use of NIPT over traditional screening tests for all pregnant women with singleton pregnancies (Dungan J. S. et al, 2023). This test has been established as the most sensitive screening test for Trisomies 21, 18 & 13.
- Under expanded screening, NIPT can additionally screen for sex chromosomal aneuploidies (SCA) such as Monosomy X (MX), XXX, XXY, and XYY.
- The overall detection rate for screening any SCA was 99.6% and specificity was 99.8% and the positive predictive values (PPVs) ranged from 29.5% (MX) to 74.5% (XYY) depending on the type of SCA (Dungan J. S. et al, 2023).
- Since 2019, this laboratory has been offering genome-wide NIPT.

OBJECTIVE

- To understand the frequency and possible biological reasons for inconclusive SCA results on NIPT.

METHOD

- Retrospective analysis was done for samples sent to our laboratory from September 2019 and the results were recorded.
- An inconclusive result for SCA was given for those samples in which the parameters did not fall in the expected risk score.
- For all inconclusive SCA results, further diagnostic testing such as QF-PCR/FISH/Karyotype/CMA along with appropriate genetic counselling and comprehensive ultrasound was recommended.
- Follow up information was obtained either from the referring clinicians or patients. This information was recorded.

RESULTS

- The results were tabulated in Fig 1 and the PPVs observed in our laboratory in Fig 2.
- Fetal aneuploidies detected Monosomy X and Mosaic XXX.
- Maternal SCA identified was XXX.

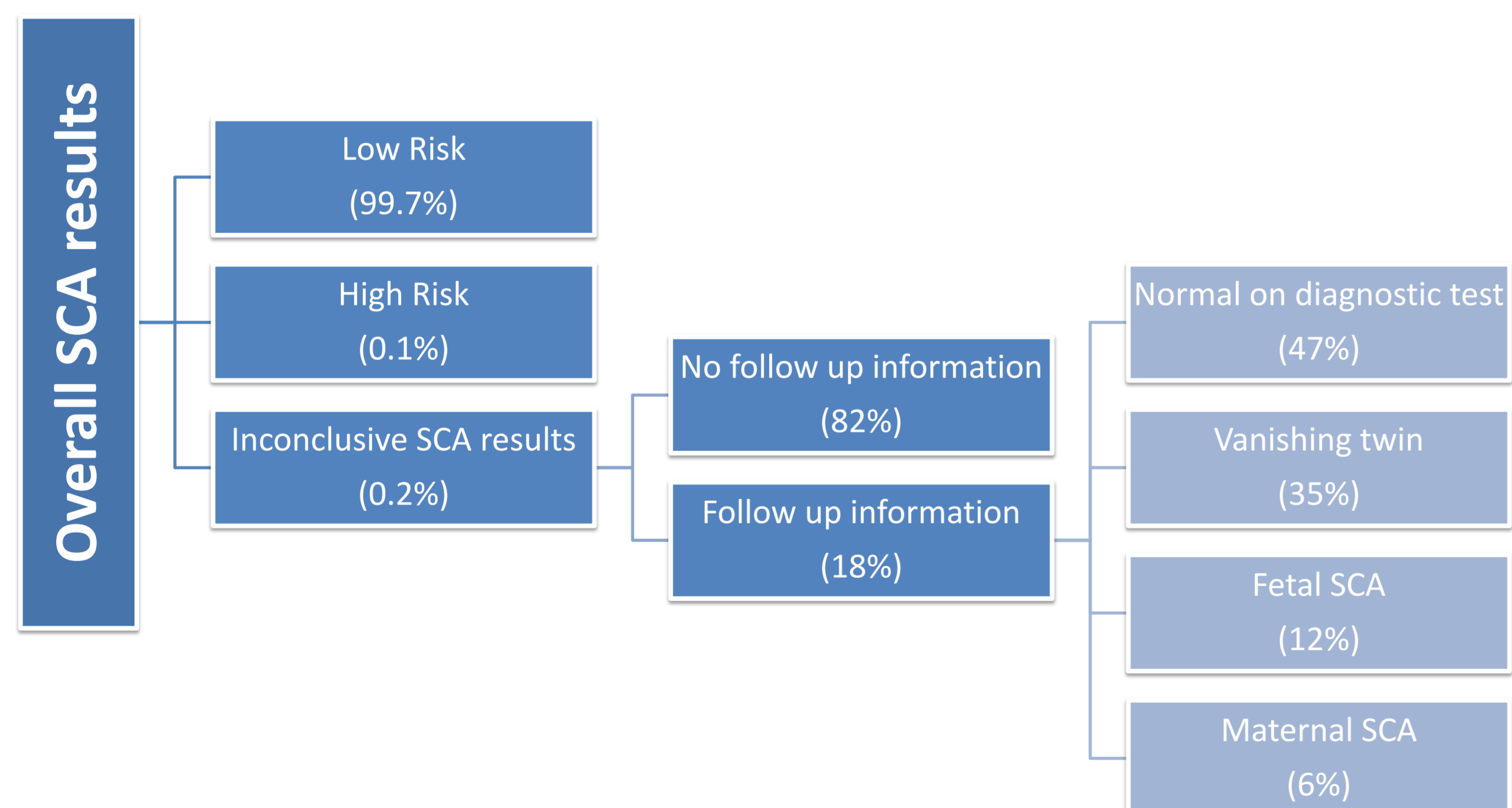


Figure 1: Overall SCA results

Conditions	MX	XYY	XXX	XXY
PPV	33.3%	66.7%	87.5%	92.8%

Figure 2: PPVs for SCAs observed in our laboratory

REFERENCES

- Johnston M. et al, *Prenat Diagn.*2023;43(2):226-234.
- Dungan J. S. et al, *Genet Med.* 2023 Aug;25(8).

ACKNOWLEDGEMENT & CONTACT

- Sincere gratitude to the MedGenome NIPT Team for helping out during the study period.
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<https://cogentlive.cme-congresses.com/>

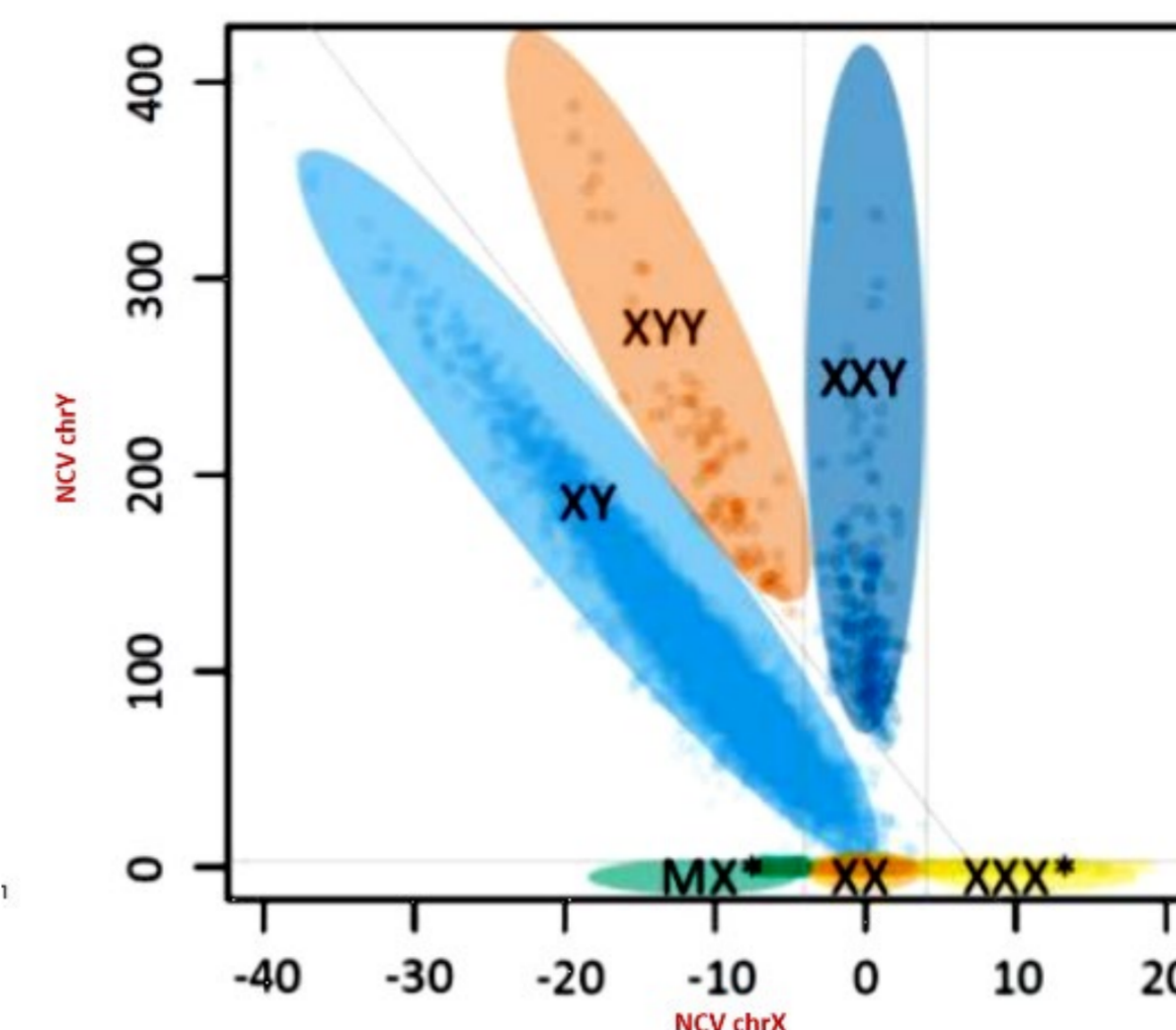


Fig 3 (a): Expected range of values

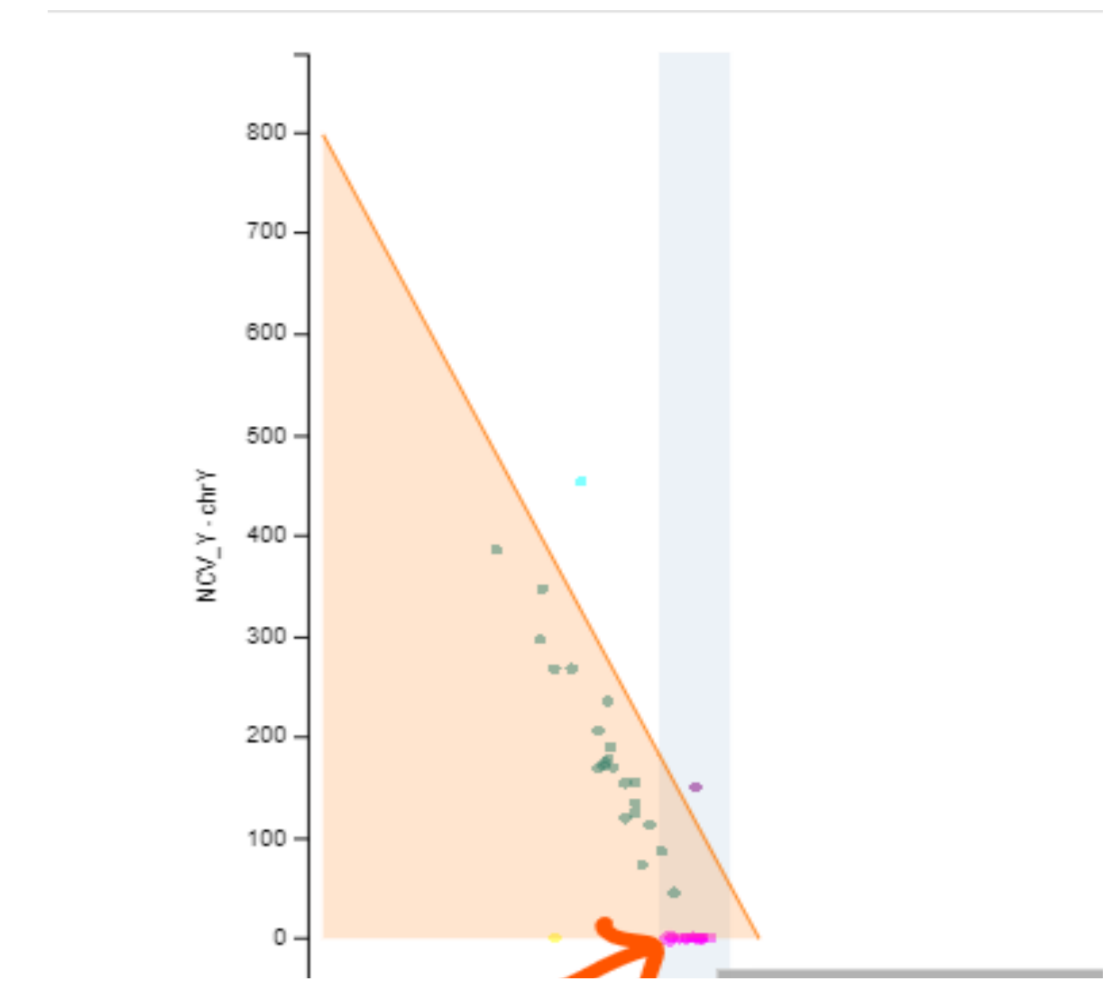


Fig 3 (b): The value was in the expected range for XX. However, other parameters were indicative of MX.

Follow up – Fetal MX

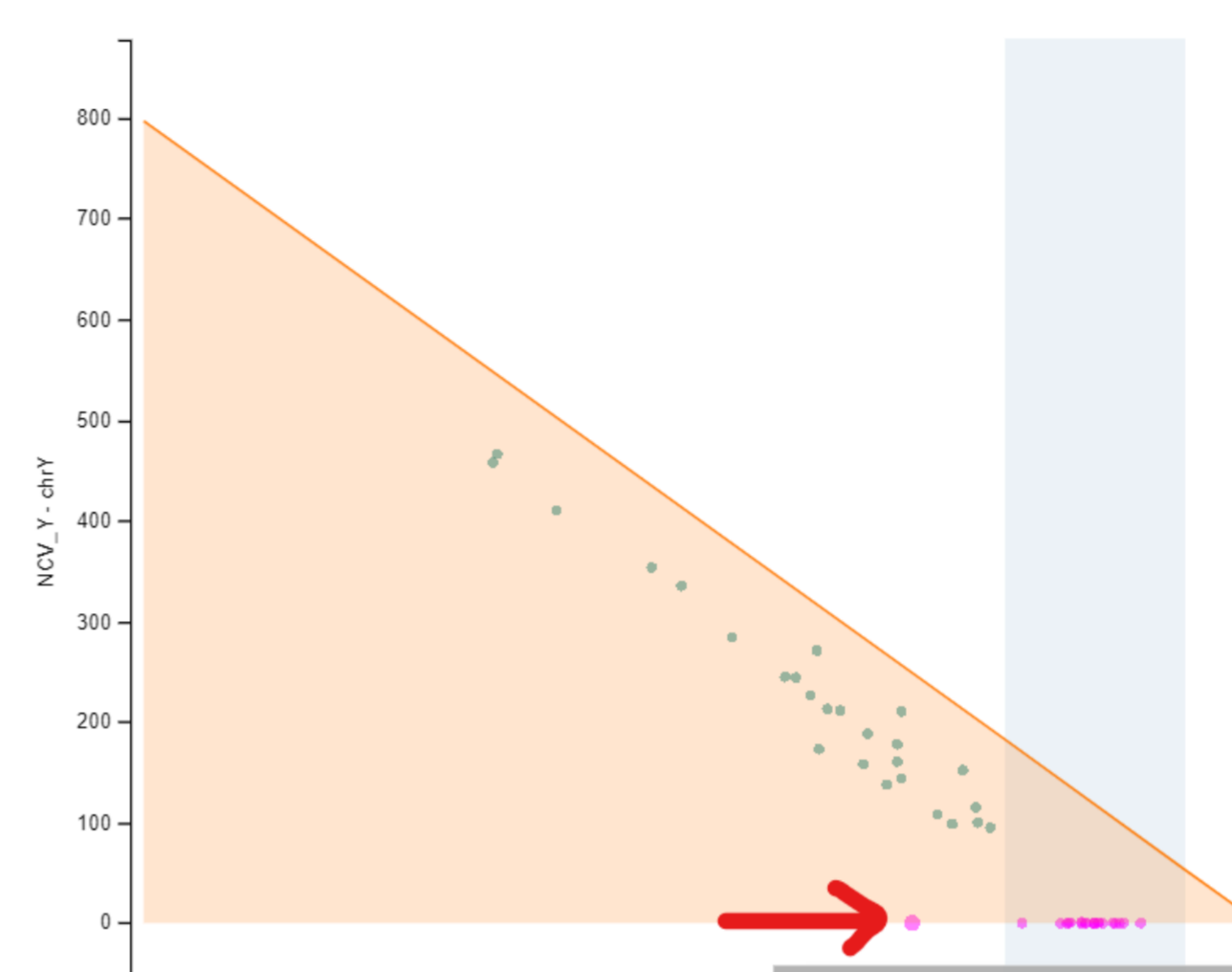


Fig 3 (c): The value was in the MX range. However, other parameters were not consistent with MX.

Follow up – Mosaic Fetal XXX – 20%

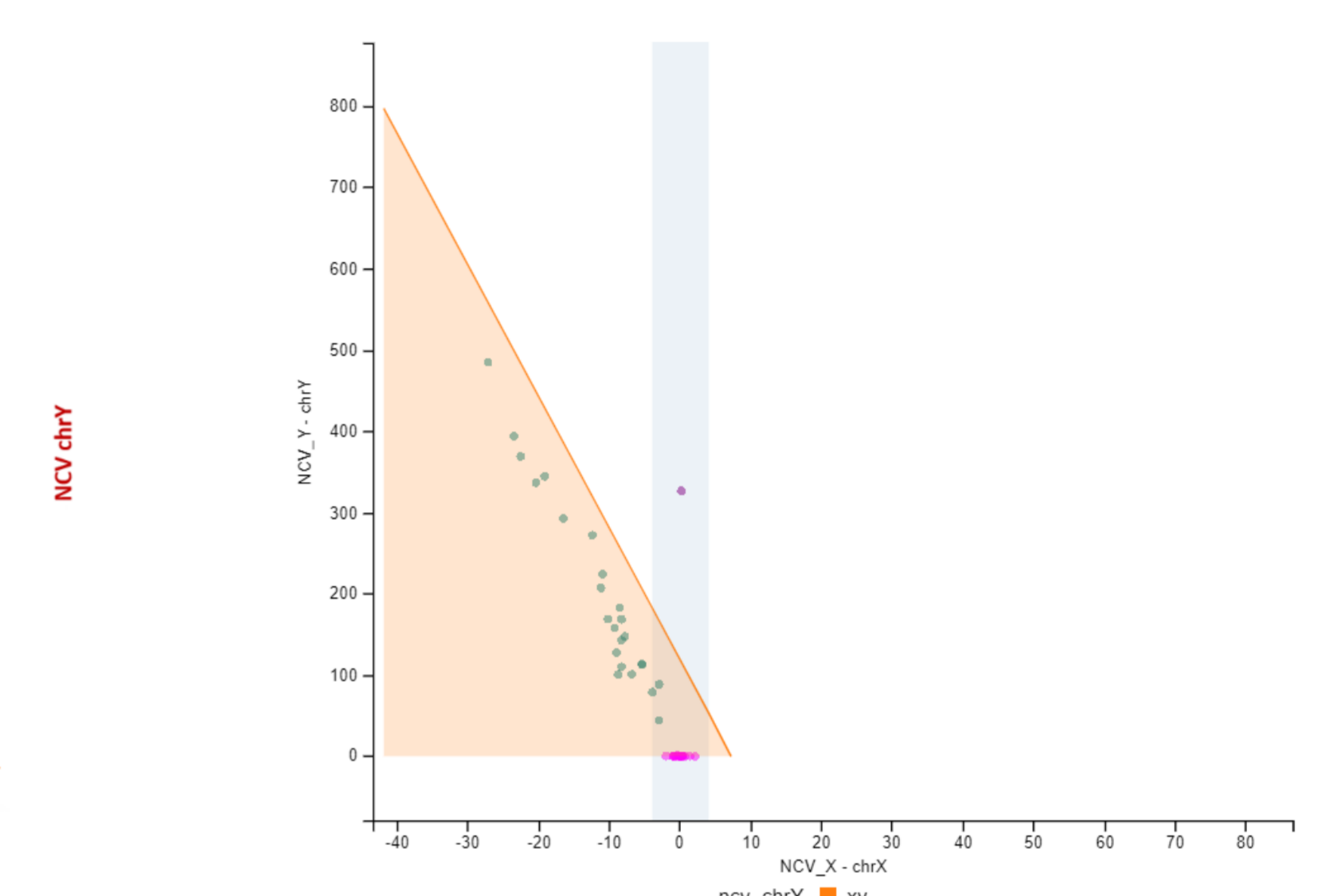


Fig 3 (d): The values didn't fall in any expected range. The test could not interpret the results and the value wasn't mapped to the graph.

Follow up – Maternal XXX

Fig 3: The graphs in different scenarios with inconclusive SCA and follow up information

DISCUSSION

- In our study, a low-risk or high-risk call was given for over 99.8% of the samples. However, for a small number of samples other biological factors were confounding the results.
- Our study highlights, the importance of careful analysis when reporting results for SCAs on NIPT.
- The analysis must be done taking into consideration the different possible biological factors that can influence the SCA result.

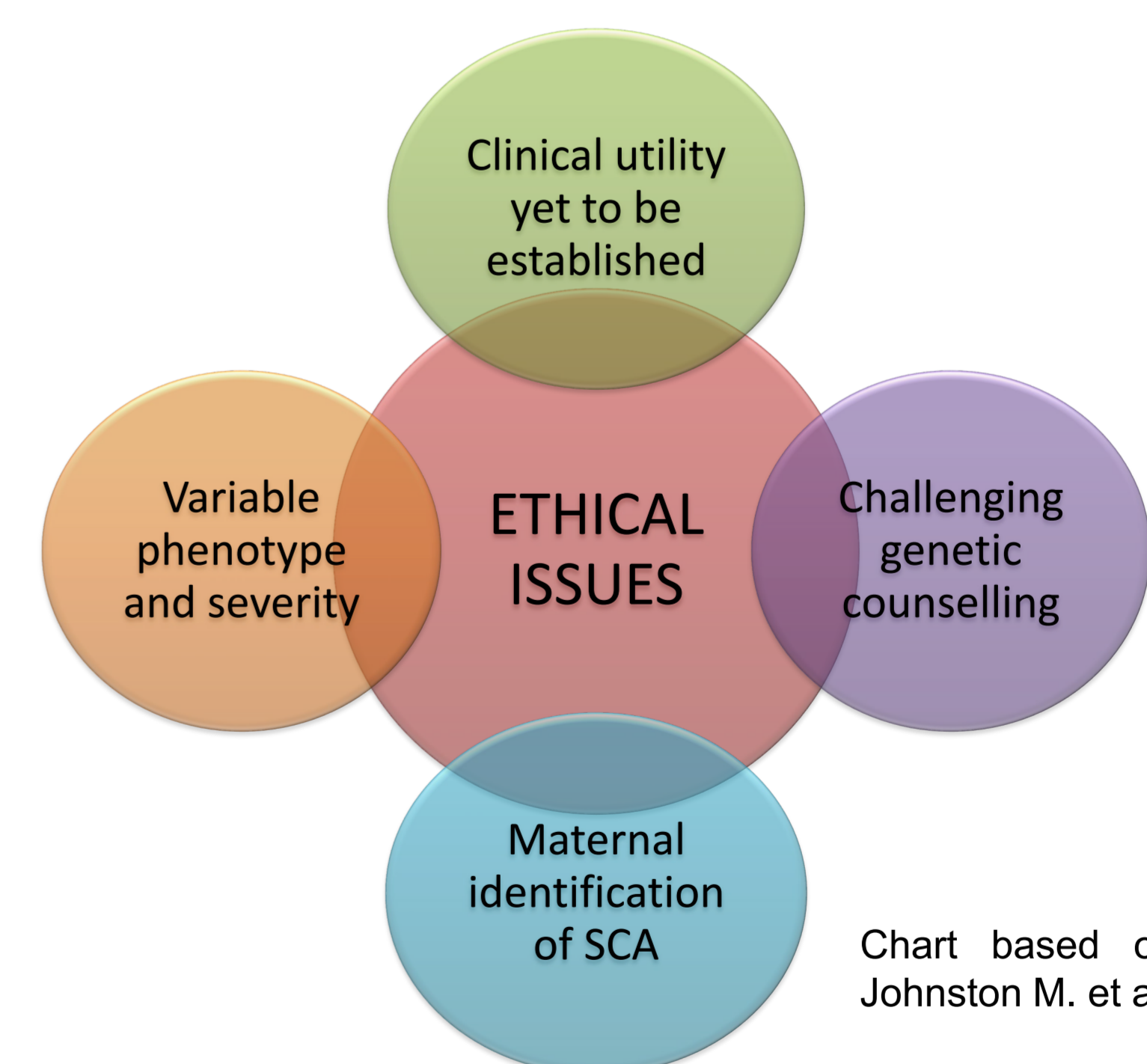
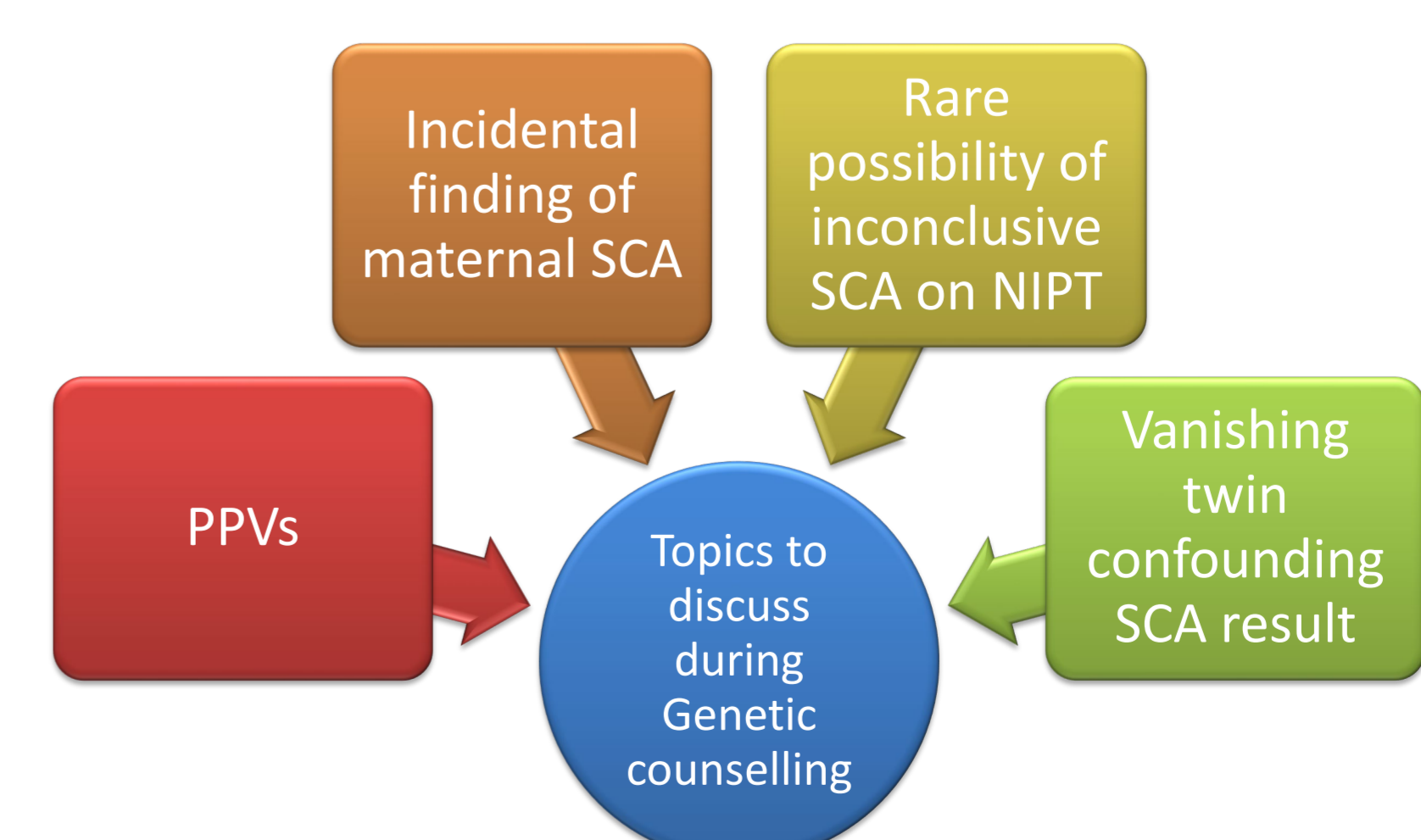


Chart based on information from Johnston M. et al, 2023.

CONCLUSION



- Pre-test and post-test counselling will help pregnant women have a better understanding of clinical implications and help them make an informed decision regarding their pregnancies.