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**Abstract Topic:-** Prenatal, perinatal and developmental genetics

**Abstract Title:-** Evaluating Economic Feasibility: A comparative Study of ddPCR and NGS-based NIPT for Fetal Aneuploidy Screening in Low-middle-income Countries

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**Aims:-** To assess the cost-effectiveness of ddPCR-based NIPT for detecting chromosome aneuploidies, comparing it with the Next-generation sequencing (NGS) platform.

**Methods:-** This study adopts a laboratory-based observational approach to investigate the cost implications of NIPT for trisomies 13, 18, and 21 using ddPCR and NGS technologies. A meticulously designed cost analysis methodology, adhering to established standards, was employed. The yearly capital and operational costs of NIPT were calculated with precision, focusing on the specific methodologies associated with ddPCR and NGS.

**Results:-** The calculated annual capital and operational costs for NIPT using the ddPCR were \$16,411 and \$246,540 while using the NGS platform were \$91,440 and \$250,560, respectively. The total cost of NIPT using ddPCR for 2,400 tests was \$262,951, with an estimated cost per test of \$110. In contrast, the total cost of NIPT using the NGS platform for 600 tests was \$342,000, resulting in an estimated cost per test of \$570.

**Conclusions:-** The ddPCR is five times more cost-effective, four times time-saver, has less complex test procedures and does not require a complex bioinformatics analysis compared to the NGS. Moreover, this preliminary outcome on cost analysis for NIPT using ddPCR, as opposed to the NGS platform, can be extended to the health technology assessment (HTA) perspective for prenatal screening programs.

**Keywords:-** NGS; ddPCR; NIPT; Trisomies/Aneuploidy; Cost-analysis.