

Global Prenatal & Maternal Diagnostic Market to 2021

<https://marketpublishers.com/r/G1268D40A40EN.html>

Date: August 2016

Pages: 389

Price: US\$ 3,800.00 (Single User License)

ID: G1268D40A40EN

Abstracts

According to WHO, nearly 140 million babies are born every year, out of which 5 million die in the first month of life, mostly in developing countries. For example, in India, about 5% to 15% of sick newborns have a metabolic disorder. This emphasizes the need for newborn screening for preventing disability and death by early intervention, follow-up and counselling.

Globally, the use of maternal serum marker screening and ultrasound imaging for the detection of chromosome aneuploidies and other birth defects constitute a routine part of prenatal care in the first and/or second trimesters. Yet, both of these techniques have the disadvantages of high false positive rates, varying from 2% to 7%. If the results of these tests show that a fetus is at increased risk of aneuploidy, invasive approaches such as chorionic villus sampling (CVS) or amniocentesis are recommended for diagnosis.

Fetal Ultrasound Screening Market

Today, ultrasound is used on average five times per pregnancy before delivery. The fetal ultrasound screening market generated revenues of about \$x million in 2014 with the potential to earn \$x million in 2021, growing at a CAGR of x%. Fetal MRI prenatal screening is performed rarely, only when the ultrasound screening provides an ambiguous result and to detect suspected central nervous system (CNS) disorders in the fetus during the second trimester. The fetal MRI segment had generated estimated revenue of \$x million in 2014 with a potential to earn \$x million in 2021.

Maternal Serum Testing Market

The global maternal serum test market was worth \$x million in 2014 and is forecast to grow and reach \$x million by 2021. The market consists of test methods for:

Pregnancy-associated plasma protein (PAPP-A)

Alpha-fetoprotein (AFP)

Human chorionic gonadotropin (hCG)

Estriol

Inhibin-A

Had it not been for the launch of noninvasive prenatal tests (NIPTs) in 2011, this market would have fared much better.

Noninvasive Prenatal Test Market

Noninvasive prenatal tests (NIPTs) are the future of prenatal screening and have shown signs of surpassing the traditional maternal serum test revenues by earning about \$x million in 2014. With a CAGR of x%, this market is forecast to reach \$x million in 2021.

Newborn Screening Market

Newborn screening is an accepted national health policy in about 52 countries. It is a well-entrenched routine of newborn care in the U.S., U.K., Japan, Australia and most western European countries for the last three decades. In the Asian continent, China, Philippines and Thailand have developed admirable newborn screening programs in a relatively short period of time. Mass spectrometry has become the standard technique for newborn screening. Using this technique, medical technologists are capable of screening as many as 30 metabolic disorders from a single sample of blood. The global market for newborn screening has been valued at \$x million in 2014 and it will be worth about \$x million by 2021.

Preimplantation Genetic Diagnosis Market

Preimplantation genetic diagnosis (PGD) has been in practice for more than twenty years in about 60 countries globally. PGD testing is performed to identify genetic defects in embryos. The tests are usually performed in cases of a known genetic defect, in late age pregnancy, or in patients with a history of repeated miscarriages. PCR, FISH, CGH, and SNP analysis are some of the most common techniques used, and

PCR is the most widely used technology. The global market for PGD was worth about \$x million in 2014 and this has been predicted to enlarge and reach \$x million in 2021.

Contents

1. INTRODUCTION

- 1.1 Executive Summary
- 1.2 Objectives of this Report
- 1.3 Key Questions Answered in this Report

2. PRENATAL PREGNANCY COMPLICATIONS: AN OVERVIEW

2.1 Advanced Maternal Age (AMA)

- 2.1.1 Risk of Down Syndrome with Increased AMA
- 2.1.2 Risk of Miscarriage with Increased AMA
- 2.1.3 Risk of Cesarean Section with Increasing AMA
- 2.1.4 Risk of Gestational Diabetes with AMA
- 2.1.5 Risk for Pregnancy-Induced Hypertension with AMA
- 2.1.6 Risk of Placenta Previa with AMA
- 2.1.7 Delayed First Pregnancy in the U.S.
 - 2.1.7.1 First Birth Rates for 35-39 Aged U.S. Women by Race

2.2 Pre-Existing Maternal Medical Conditions

- 2.2.1 Pregnancy Outcome in Women with Renal Disease
- 2.2.2 Pregnancy Outcome in Diabetic Women
- 2.2.3 Pregnancy Outcome in Women with Pre-Existing Thyroid Disease
- 2.2.4 Pregnancy Outcome in Obese Women
- 2.2.5 Pregnancy Outcome in Asthmatic Women
- 2.2.6 Pregnancy Outcome in Women with Epilepsy
- 2.2.7 Pregnancy Outcome in Women with Autoimmune Diseases
- 2.2.8 Pregnancy Outcome in Women with Hemoglobinopathies
- 2.2.9 Pre-Existing Chronic Diseases among Women of Reproductive Ages in the U.S.
 - 2.2.9.1 Chronic Disease Risk Behaviors and Risk Factors among Women of

Reproductive Ages in the U.S

2.3 Medical Conditions Occurring During Pregnancy

- 2.3.1 Preeclampsia (Toxemia)
 - 2.3.1.1 Prevalence of Preeclampsia in the U.S
- 2.3.2 Gestational Diabetes in the U.S
 - 2.3.2.1 Prevalence of Gestational Diabetes in the U.S

2.4 Pregnancy-Related Issues

- 2.4.1 Premature Labor
 - 2.4.1.1 Common Medical Complications in Premature Babies

- 2.4.1.2 Global Prevalence of Preterm Labor
- 2.4.1.3 Prevalence of Preterm Births in the U.S. by Stage
- 2.4.1.4 Prevalence of Preterm Births in the U.S. by Race/Ethnicity
- 2.4.1.5 Prevalence of Preterm Births in the U.S. by Plurality of Birth
- 2.4.1.6 Prevalence of Preterm Births in the U.S. by Maternal Age
- 2.4.1.7 Multiple Births in the U.S
- 2.4.2 Placenta Previa
- 2.4.3 Breech Presentation
- 2.4.4 Meconium Stained Liquor
- 2.4.5 Oligohydramnios and Polyhydramnios
- 2.5 Fetal Problems
 - 2.5.1 Fetal Growth Restriction
 - 2.5.2 Imperforate Anus
 - 2.5.3 Congenital Heart Disease

3. TYPES OF GENETIC DISEASES IN FETUSES: AN OVERVIEW

- 3.1 Single Gene Disorders
 - 3.1.1 Autosomal Dominant Genetic Disorders
 - 3.1.1.1 Huntington Disease (HD)
 - 3.1.1.2 Familial Hypercholesterolaemia (FH)
 - 3.1.1.3 Marfan syndrome
 - 3.1.1.4 Myotonic Dystrophy
 - 3.1.2 Autosomal Recessive Genetic Disorders
 - 3.1.2.1 Cystic Fibrosis (CF)
 - 3.1.2.2 Canavan Disease
 - 3.1.2.3 Neutropenia
 - 3.1.2.4 Ellis-van Creveld Syndrome (EVC)
 - 3.1.2.5 Familial Mediterranean fever (FMF)
 - 3.1.2.6 Faconi Anemia (FA)
 - 3.1.2.7 Gaucher Disease
 - 3.1.2.8 Mucopolysaccharidosis (MPSs)
 - 3.1.2.9 Phenylketonuria (PKU)
 - 3.1.2.10 Sickle Cell Disease
 - 3.1.2.11 Beta-Thalassaemia
 - 3.1.2.12 Inheritance Pattern of Autosomal Recessive Genetic Disorders
 - 3.1.2.13 Chances of Inheriting a Single Gene Disorder
 - 3.1.2.14 Common Recessive Disease Traits in Selected Ethnic Groups
 - 3.1.2.15 Comprehensive List of Common Single Gene Disorders

- 3.1.3 X-Linked Dominant Genetic Disorders
 - 3.1.3.1 Hypophosphotemic Rickets
 - 3.1.3.2 Incontinentia Pigmenti
 - 3.1.3.3 Focal Dermal Hypoplasia
 - 3.1.3.4 Orofaciodigital Syndrome
 - 3.1.3.5 Inheritance of Sex-Linked Dominant Disorders
- 3.1.4 X-Linked Recessive Disorders
 - 3.1.4.1 Lesch-Nyhan Syndrome
 - 3.1.4.2 Menkes Disease (Kinky hair syndrome)
 - 3.1.4.3 Hemophilia A and B
 - 3.1.4.4 Fabry's Disease
 - 3.1.4.5 Wiskott-Aldrich syndrome (WAS)
 - 3.1.4.6 Bruton's Aggamaglobulinemia
 - 3.1.4.7 Color Blindness
 - 3.1.4.8 Complete Androgen Insensitivity Syndrome
 - 3.1.4.9 Inheritance of X-Linked Recessive Traits
- 3.2 Chromosomal Disorders
 - 3.2.1 47, XXY (Klinefelter Syndrome)
 - 3.2.1.1 Prenatal Diagnosis of Klinefelter Syndrome
 - 3.2.2 47, XYY Syndrome
 - 3.2.2.1 Diagnosis of 47, XYY Syndrome
 - 3.2.3 45, X Syndrome (Turner Syndrome)
 - 3.2.3.1 Prenatal Diagnosis of Turner Syndrome
 - 3.2.4 47, XXX (Triple X Syndrome)
 - 3.2.4.1 Tests for Triple X Syndrome
 - 3.2.5 Trisomy 21 (Down Syndrome)
 - 3.2.5.1 Tests for Down Syndrome
 - 3.2.5.2 Incidence of Down Syndrome by Maternal Age
 - 3.2.5.3 Developmental Delay in Children with Down Syndrome
 - 3.2.6 Trisomy 18 (Edward's Syndrome)
 - 3.2.6.1 Prenatal Diagnosis of Trisomy
 - 3.2.6.2 Clinical Manifestations of Trisomy
 - 3.2.7 Trisomy 13 (Patau Syndrome)
 - 3.2.7.1 Prenatal Diagnosis of Trisomy
 - 3.2.8 Triploid Syndrome
 - 3.2.8.1 Congenital Anomalies Associated with Triploidy
 - 3.2.8.2 Prenatal Diagnosis of Triploidy
 - 3.2.9 Prevalence of Trisomies in the U.S
 - 3.2.9.1 Trisomies and Abortions

- 3.2.10 Maternal Age-Related Frequencies of Aneuploid Fetuses
- 3.2.11 Clinical Features of Common Chromosomal Aneuploidy
- 3.2.12 Maternal Age and Chromosomal Aneuploidy
- 3.2.13 Sensitivity and Specificity of Maternal Serum and Ultrasound Tests for Aneuploids
- 3.3 Structural Chromosomal Abnormalities
 - 3.3.1 Autosomal Deletions
 - 3.3.1.1 Wolf-Hirschhorn Syndrome (WHS)
 - 3.3.1.2 Cri du chat Syndrome
 - 3.3.1.3 Langer-Giedion Syndrome
 - 3.3.2 Common Autosomal Microdeletion Syndrome
 - 3.3.2.1 Williams Syndrome
 - 3.3.2.2 WAGR Syndrome
 - 3.3.2.3 Prader-Willi Syndrome (PWS)
 - 3.3.2.4 Angelman Syndrome
 - 3.3.2.5 Miller-Dieker Syndrome
 - 3.3.2.6 Smith-Magenis Syndrome (SMS)
 - 3.3.2.7 Alagille Syndrome (ALGS)
 - 3.3.2.8 CATCH 22 Syndrome
 - 3.3.2.9 DiGeorge Syndrome
 - 3.3.3 Autosomal Duplication Syndromes
 - 3.3.3.1 Beckwith-Wiedemann Syndrome (BWS)
 - 3.3.3.2 Charcot-Marie-Tooth Disease Type 1A (CMT1A)
 - 3.3.3.3 Cat-Eye Syndrome
 - 3.3.4 Appropriate Technologies for the Detection of Microdeletions, Duplications and Copy Number Variants

4. GENETIC COUNSELING: AN OVERVIEW

- 4.1 Impact of Recent Advances in Clinical Genomics on Genetic Counseling
- 4.2 Genetic Counselors in DTC GT Industry
 - 4.2.1 Types of Genetic Counseling Offered by DTC GT Companies
 - 4.2.2 Roles of Genetic Counselors in DTC GT Industry

5. PRENATAL SCREENING FOR GENETIC DISEASES: AN OVERVIEW

- 5.1 Routine Prenatal Screening Tests
- 5.2 Less-Routine Prenatal Screening Tests
- 5.3 Beta Human Chorionic Gonadotropin (?-hCG) Screening Test

- 5.3.1 hCG Kits and Manufacturers
- 5.4 First Trimester Pregnancy-Associated Plasma Protein-A (PAPP-A) Screening Test
- 5.5 Maternal Serum Alpha-Fetoprotein (MSAFP) Screening Test
- 5.6 Second Trimester Serum α -hCG Screening Test
- 5.7 Second Trimester Unconjugated Estriol (uE3) Screening Test
- 5.8 Second Trimester Inhibin-A Screening Test
- 5.9 Second Trimester Hexosaminidase Test
- 5.10 Second Trimester Triple-Screen Quad Screen Tests
- 5.11 Second Trimester Screening of Cell-Free Fetal DNA (cffDNA)
 - 5.11.1 Sensitivity and Specificity of NIPTs
 - 5.11.2 Diagnostic Applications of cffDNA
 - 5.11.3 Time of Availability of cffDNA in Maternal Blood
 - 5.11.4 The Cost of NIPTs
 - 5.11.5 Cost of NIPTs by Product
 - 5.11.6 History of Aneuploidy Testing from 1970s to 2011
 - 5.11.7 NIPT Methods of Detecting Aneuploidy
 - 5.11.7.1 Shotgun Method
 - 5.11.7.2 Targeted Massively Parallel Sequencing (t-MPS)
 - 5.11.7.3 Single Nucleotide Polymorphisms (SNPs)
 - 5.11.8 Comparison of Amniocentesis and NIPT
 - 5.11.9 Advantages of NIPTs
 - 5.11.10 Disadvantages of NIPTs
 - 5.11.11 Comparison of Performance Criteria for Commonly used Prenatal Tests
 - 5.11.12 Comparison of NIPT Detection Rates with Traditional Tests
 - 5.11.13 False Positive Rates of NIPTs Compared with Those of Traditional Tests
 - 5.11.14 Fetal Genetic Disorders Detected by NIPTs and other Screening Tests
- 5.12 First Trimester Ultrasound Screening Test
 - 5.12.1 Nuchal Translucency (NT) Screening Test
- 5.13 Magnetic Resonance Imaging (MRI) in Prenatal Screening
- 5.14 Prenatal Diagnosis of Genetic Disorders
 - 5.14.1 Amniocentesis (AC)
 - 5.14.1.1 Reliability of Amniocentesis
 - 5.14.2 Chorionic Villus Sampling (CVS)
 - 5.14.2.1 Reliability of CVS Test
 - 5.14.3 Cordocentesis or Percutaneous Umbilical Blood Sampling
- 5.15 Advantages and Disadvantages of Prenatal Diagnostic Tests
- 5.16 Future of Invasive Prenatal Diagnostic Tests
 - 5.16.1 Indispensability of Invasive Diagnostic Tests
- 5.17 Intact Circulating Fetal Cells for Noninvasive Prenatal Tests

- 5.17.1 Scheme for Isolating Intact Fetal Cells from Maternal Blood
- 5.18 Trophoblast Retrieval and Isolation from Cervix (TRIC)

6. NEWBORN SCREENING

- 6.1 Status of Newborn Screening in Developed and Developing Countries
- 6.2 Status of Newborn Screening in Middle East and North Africa (MENA)
- 6.3 Screening Tests Recommended for Newborns in the U.S
- 6.4 Most Common Newborn Genetic Disorders
 - 6.4.1 Phenylketonuria (PKU)
 - 6.4.1.1 Screening Tests Used for Diagnosis of PKU
 - 6.4.2 Congenital Hypothyroidism (CHT)
 - 6.4.2.1 Inheritance of CHT
 - 6.4.2.2 Signs and Symptoms of CHC
 - 6.4.2.3 Diagnosis of CHT
 - 6.4.3 Congenital Adrenal Hyperplasia
 - 6.4.3.1 Inheritance of Congenital Adrenal Hyperplasia
 - 6.4.3.2 Symptoms of Congenital Adrenal Hyperplasia
 - 6.4.3.3 Diagnosis of Congenital Adrenal Hyperplasia
 - 6.4.4 Galactosemia
 - 6.4.4.1 Signs and Symptoms of Galactosemia
 - 6.4.4.2 Diagnosis of Galactosemia
 - 6.4.5 Sickle Cell Disease (SCD)
 - 6.4.5.1 Symptoms of SCD
 - 6.4.5.2 Diagnosis of SCD
 - 6.4.6 Biotidinase Deficiency
 - 6.4.6.1 Inheritance of Biotidinase Deficiency
 - 6.4.6.2 Signs and Symptoms of Biotidinase Deficiency
 - 6.4.6.3 Diagnosis of Biotidinase Deficiency
 - 6.4.7 Homocystinuria
 - 6.4.7.1 Signs and Symptoms of Homocystinuria
 - 6.4.7.2 Diagnosis of Homocystinuria
 - 6.4.8 Maple Syrup Urine Disease (MSUD)
 - 6.4.8.1 Inheritance of MSUD
 - 6.4.8.2 Diagnosis of MSUD

7. PRECONCEPTION/CARRIER SCREENING

- 7.1 Introduction

- 7.2 What are the Main Commercially Available Carrier Tests on the Market?
- 7.3 Preimplantation Genetic Screening and Preimplantation Genetic Diagnosis (PGS/PGD)
- 7.4 PGS/PGD Technologies
 - 7.4.1 Fluorescent in situ Hybridization (FISH)
 - 7.4.2 Array Comparative Genome Hybridization (aCGH)
 - 7.4.3 Single Nucleotide Polymorphism (SNP) Microarray
 - 7.4.4 Oligonucleotide Genome Sequencing (OGS)
 - 7.4.5 Express Genome Sequencing (EGS)
 - 7.4.6 Next Generation Sequencing (NGS)
- 7.5 Strengths and Weaknesses of Currently Available PGS/PGD Technologies
- 7.6 Genetic Diseases Detected During PGD
- 7.7 PGS/PGD Testing Products in the Market
- 7.8 Cost of in vitro Fertilization and Related Procedures

8. PREGNANCY, PRENATAL, NEWBORN AND PGD-RELATED TECHNOLOGIES: AN OVERVIEW

- 8.1 Beta Human Chorionic Gonadotropin (?-hCG) Test
 - 8.1.1 Setting up the Test Strip
 - 8.1.2 Procedure of the Test
 - 8.1.3 Interpretation of ?-hCG Test Result
- 8.2 Pregnancy Associated Plasma Protein-A (PAPP-A) Test
 - 8.2.1 Principle of PAPP-A Test
- 8.3 Maternal Serum Alpha Fetoprotein (MSAFP) Test
 - 8.3.1 Principle of MSAFP Test
- 8.4 Unconjugated Estriol (uE3) Test
 - 8.4.1 Principle of uE3 Test
- 8.5 Inhibin A Test
 - 8.5.1 Principle of Inhibin A Test
- 8.6 Fetal Karyotyping
- 8.7 Extended Banding Chromosome Studies
- 8.8 Innovation in Invasive Prenatal Diagnosis
 - 8.8.1 Microarray: An Alternative for Karyotyping
 - 8.8.2 Rapid Aneuploid Detection by Quantitative Fluorescent PCR (QF-PCR)
 - 8.8.2.1 Principles of QF-PCR
 - 8.8.3 Fluorescence in situ Hybridization (FISH)
 - 8.8.3.1 The Format of Fish Test Result
 - 8.8.3.2 Commonly Used FISH-Based Tests

- 8.8.3.3 Microdeletions/Microduplications Detectable by FISH
- 8.8.3.4 Types of FISH Probes and Their Functions
- 8.8.4 Microarray-Based Comparative Genomic Hybridization (array-CGH)
- 8.9 Advances in Prenatal Screening: The Power to Know Sooner
 - 8.9.1 NIPTs: An Overview of Tests and Technologies
 - 8.9.1.1 Harmony Test
 - 8.9.1.2 InformaSeq
 - 8.9.1.3 Panorama Test
 - 8.9.1.4 Prena Test
 - 8.9.1.5 NIFTY Test
 - 8.9.1.6 IONA Test
 - 8.9.1.7 Verifi Test
 - 8.9.1.8 MaterniT GENOME Test
 - 8.9.1.9 MaterniT21 PLUS Test
 - 8.9.1.10 HeridiT UNIVERSAL Carrier Screen
 - 8.9.2 Comparison of MaterniT21 PLUS, Verifi, Harmony and Panorama Tests
 - 8.9.3 U.S. Patents for NIPTs by Company
 - 8.9.3.1 Selected Issued Patents of NIPTs
 - 8.9.3.2 Assignees of Major U.S. Patents and their Current Licensees
 - 8.9.4 Global Availability of NIPTs
 - 8.9.5 Cost Effectiveness of NIPTs
 - 8.9.6 Clinical Implementation Strategies to be adopted for NIPTs
 - 8.9.7 Integration of NIPT into Healthcare System: Patient-Directed Model
- 8.10 Tandem Mass Spectrometry (MS/MS) in Newborn Screening
- 8.11 Fetal Ultrasound in Prenatal Screening
 - 8.11.1 Types of Fetal Ultrasound Exams
 - 8.11.2 Best Obstetric and Gynecological Ultrasound Systems in the Market
 - 8.11.3 Best Premium Fetal Ultrasound Machines
 - 8.11.3.1 Philips Epiq
 - 8.11.3.2 GE Voluson E8
 - 8.11.3.3 GE Voluson E10
 - 8.11.3.4 Samsung UGEO WS80A
 - 8.11.4 High-End Systems
 - 8.11.4.1 Philips Epiq
 - 8.11.4.2 Philips Affinity
 - 8.11.4.3 GE Voluson E6
 - 8.11.4.4 GE Voluson S8
 - 8.11.5 Midrange Systems
 - 8.11.5.1 Philips Affinity

- 8.11.5.2 GE Voluson S6
- 8.11.5.3 Samsung AccuVix A30
- 8.11.5.4 Philips Clear Vue
- 8.11.6 Economy Systems
 - 8.11.6.1 Philips Clear Vue
 - 8.11.6.2 GE Logiq P5
 - 8.11.6.3 Samsung H60
 - 8.11.6.4 Alpinion Ecube
- 8.11.7 Portable Systems
 - 8.11.7.1 GE Voluson
 - 8.11.7.2 Samsung UGEO HM70A
- 8.12 Therapeutic Genome Editing: A Breakthrough Technology
 - 8.12.1 Genome Editing Technologies
 - 8.12.1.1 Growing Popularity of CRISPR Kits
 - 8.12.2 Therapeutic Applications of Genome Editing
 - 8.12.3 The First Genetically Modified Human Embryos

9. MARKET ANALYSIS

- 9.1 Preconception/Carrier Screen Market Analysis
 - 9.1.1 Major Players in the Preconception/Carrier Testing Market
 - 9.1.2 Market Size of Multi-Panel and Expanded Screening Market
- 9.2 Prenatal Screening and Diagnostics: Market Overview
 - 9.1 Global Market for Fetal Ultrasound
 - 9.1.1 Market Leaders in Fetal Ultrasound
 - 9.2 Global Market for Prenatal MRI Screening
 - 9.3 Global Market for Maternal Serum Screening Tests
 - 9.4 Global Market for Noninvasive Prenatal Tests (NIPTs) using cffDNA
 - 9.4.1 Global Market for NIPTs by Product
 - 9.5 Global Market for Prenatal Diagnostic Invasive Tests
 - 9.6 Global Market for Newborn Screening for Genetic Diseases
 - 9.6.1 Newborn Screening Market by Technology
 - 9.7 Global Market for Preimplantation Screening/Diagnosis (PGS/PGD)

10. OTHER GENETIC TESTING-RELATED MARKETS

- 10.1 Emerging Trends in Molecular Diagnostics Market
- 10.2 Emerging Trends in Liquid Biopsy Market
- 10.3 Emerging Trends in Personalized Medicine Diagnostics Market

10.4 Emerging Trends in in vitro Diagnostics (IVD) Market

11. MARKET SWOT AND STRATEGY ANALYSIS

11.1 Acquisition Activities in Prenatal Screening Industry

11.1.1 Acquisition of BlueGenome by Illumina

11.1.2 Illumina's Acquisition of Verinata

11.1.3 Eurofin's Joint Venture with Emory Genetics Laboratory

11.1.4 Roche's Acquisition of Ariosa Diagnostics

11.1.5 Cooper Surgical's Acquisition of Reprogenetics

11.2 Market Drivers

11.3 Market Restraints

11.4 Future of Prenatal Screening

11.5 Legislation Mandating Newborn Screening by Geography

11.5.1 Newborn Screening Programs in Americas

11.5.2 Newborn Screening Programs in Asia/Pacific

11.5.3 Newborn Screening Programs in Europe

11.5.4 Newborn Screening Programs in Middle East and Northern Africa

11.6 Ethical Voices against Problematic Applications of NIPT and NIPD

11.7 Clinical Implementation of NIPTs

11.7.1 Implementation of NIPTs in Developed Countries

11.7.3 Implementation of NIPTs in Developing and Under-Developed Countries

11.8 Adoption Rates for Different Prenatal Tests in the U.S

12. COMPANY PROFILES

12.1 23andMe Inc

12.1.1 23andMe's Agreement with Pfizer

12.1.2 23andMe's Agreement with Genentech

12.1.3 FDA's Approval for 23andMe's Screening Test for Bloom Syndrome

12.2 Abbott Laboratories

12.2.1 ARCHITECT AFP Assay

12.3 Abbott Molecular Inc

12.3.1 AneuVysion

12.3.2 Cystic Fibrosis Genotyping Assay

12.4 Abcam plc

12.4.1 hCG Human ELISA Kit

12.5 AB Sciex LLC

12.6 Adaltis S.r.l

- 12.6.1 CLIAgen Free Beta-hCG Kit
- 12.7 Adaptive Biotechnologies Corp
 - 12.7.1 ImmunoSEQ Platform
 - 12.7.2 ClonoSEQ
 - 12.7.3 Pipeline
 - 12.7.3.1 Quantifying Tumor Infiltration Lymphocytes in Solid Tumors
 - 12.7.3.2 Measuring Immune Reconstitution Post Transplant
 - 12.7.3.3 Diagnosing Cutaneous T-Cell Lymphoma (CTCL)
 - 12.7.3.4 Therapeutics
- 12.8 Affymetrix Inc
 - 12.8.1 Microarray Solutions
 - 12.8.2 Affymetrix's Collaborating Partners
 - 12.8.3 Affymetrix's R&D Investment
- 12.9 Agena Biosciences Inc
 - 12.9.1 MassARRAY System
 - 12.9.2 Acquisition of Sequenom's Bioscience Business by Agena Biosciences
- 12.10 Agilent Technologies Inc
 - 12.10.1 SureScan Microarray Scanner
 - 12.10.2 OneSeq
- 12.11 Ambry Genetics Corp
 - 12.11.1 Clinical Diagnostic Tests
- 12.12 Analogic Corp
 - 12.12.1 Flex Focus
 - 12.12.1 SonixTouchQ+
 - 12.12.3 SonixSP Q+
- 12.13 Ariosa Diagnostics Inc
 - 12.13.1 Harmony Test
 - 12.13.2 Granting of Licenses to Harmony Test
- 12.14 Ansh Labs
 - 12.14.1 picoPAPP-A ELISA Kit
 - 12.14.2 Inhibin A ELISA Kit
- 12.15 Appistry Inc
 - 12.15.1 GenomePilot
 - 11.15.2 Ayrris for NGS Analysis
 - 12.15.3 Variant Annotation and Analysis Suite
 - 12.15.4 CloudDx Translational
 - 12.15.5 CloudDx Clinical
 - 12.15.6 Appistry's Partnership with LifeMap Sciences
- 12.16 ARUP Laboratories

- 12.16.1 Prenatal Screening and Diagnosis
- 12.16.2 Next-Generation Sequencing (NGS)
- 12.16.3 Noninvasive Prenatal Test for Aneuploids
- 12.17 AssureRx Health Inc
 - 12.17.1 GeneSight Psychotropic
 - 12.17.2 GeneSight Analgesic
 - 12.17.3 GeneSight ADHD
 - 12.17.4 GeneSight MTHFR
- 12.18 Asuragen Inc
 - 12.18.1 AmpliX FMR1 PCR
 - 12.18.2 AmpliX FMR1 mPCR
 - 12.18.3 AmpliX Controls
 - 12.18.4 Quantidex Pan Cancer Kit
 - 12.18.5 Quantidex BCR/ABL1 Quant Kit
 - 12.18.6 Quantidex DNA Assay
 - 12.18.7 Signature Technology
 - 12.18.8 Signature KRAS Mutations
 - 12.18.9 Signature BRAF Mutations
 - 12.18.10 Signature LTx v2
 - 12.18.11 Signature NPM1 Mutations
- 12.19 Athena Diagnostics Inc
- 12.20 AutoGenomics Inc
 - 12.20.1 INFINITI System
- 12.21 Base4 Innovation Ltd
 - 12.21.1 Microdroplet Sequencing
- 12.22 Beckman Coulter Inc
 - 12.22.1 SPRIworks System I for Illumina Genome Analyzer
 - 12.22.2 SPRIworks HT for Illumina NGS Platform
 - 12.22.3 SPRIselect Reagent Kit
 - 12.22.4 Automated Sample Preparation
 - 12.22.5 Genomic Services
 - 12.22.6 Access Total Beta-hCG Reagent
 - 12.22.7 Access Inhibin A Assay
- 12.23 erry Genomics Co., Ltd
 - 12.23.1 Bambni Test
 - 12.23.2 Berry's Partnership with Illumina
- 12.24 Bina Technologies Inc
 - 12.24.1 Bina RAVE
 - 12.24.2 Bina AAiM

- 12.24.3 Bina's Collaboration with AsraZeneca
- 12.25 Bio-Rad (Israel) Laboratories Inc
- 12.26 BGI
- 12.27 Blueprint Genetics Oy
 - 12.27.1 Services
- 12.28 Boreal Genomics Inc
 - 12.28.1 OnTarget Mutation Detection System
 - 12.28.2 Aurora Platform
- 12.29 Cambridge Epigenetix Ltd
 - 12.29.1 TrueMethyl Seq Kit
 - 12.29.2 TrueMethyl Array
- 12.30 Caris Lifesciences
 - 12.30.1 ADAPT Biotargeting System
 - 12.30.2 Caris Molecular Intelligence
 - 12.30.3 Collaboration between Caris Lifesciences and Syapse
- 12.31 CeGaT GmbH
 - 12.31.1 NGS Service
 - 12.31.2 ADME Research Panel
 - 12.31.3 Forschungsexom
- 12.32 Centogene AG
- 12.33 Chromsystems Instruments & Chemicals GmbH
- 12.34 Chronix Biomedical Inc
 - 12.34.1 Technology
- 12.35 Claritas Genomics Inc
- 12.36 CLC bio A/S
 - 12.36.1 Products
- 12.37 Combimatrix Corp
 - 12.37.1 CombiSNP Array for Prenatal Diagnosis
 - 12.37.2 CombiPGS
- 12.38 Contec Medical Systems Co., Ltd
 - 12.38.1 CMS600P B-Ultrasound Diagnostic System
 - 12.38.2 CMS600B3 B-Ultrasound Diagnostic System
- 12.39 Coriell Life Sciences Inc
 - 12.39.1 GeneDose
- 12.40 Correlagen Diagnostics Inc
- 12.41 Counsyl Inc
 - 12.41.1 Family Prep Screen
 - 12.41.2 Informed Pregnancy Screen
 - 12.41.3 Inherited Cancer Screen

- 12.42 Courtagen Life Sciences Inc
- 12.43 Creative Diagnostics
 - 12.43.1 Alpha-Fetoprotein, AFP ELISA Kit
 - 12.43.2 hCG ELISA Kit
 - 12.43.3 Human Free Estriol ELISA Kit
- 12.44 Cynvenio Biosystems Inc
 - 12.44.1 LiquidBiopsy
 - 12.44.2 ClearID
 - 12.44.3 Thermo Fisher's Distribution Agreement with Crynvenio
 - 12.44.4 Cynvenio's Collaboration with the University of Southern Denmark
- 12.45 Diagnostic Automation/Cortez Diagnostics Inc
- 12.46 Demeditec Diagnostics GmbH
 - 12.46.1 Estriol, Free/Uncojugated ELISA
- 12.47 DRG International Inc
 - 12.47.1 DRG PAPP-A ELISA
- 12.48 DNA Electronics Ltd
 - 12.48.1 Genalysis
- 12.49 DNA Link Inc
 - 12.49.1 Services
 - 12.49.2 Partnership between Affymetrix and DNA Link Inc
 - 12.49.3 DNAGPS
 - 12.49.4 AccuID
- 12.50 DNAnexus Inc
 - 12.50.1 Adoption of DNAnexus' Cloud Genomics Platform by Natera
- 12.51 Eagle Biosciences Inc
 - 12.51.1 Alport Syndrome Kit
 - 12.51.2 Free Beta-hCG ELISA
- 12.52 Eagle Genomics Ltd
 - 12.52.1 EagleCore
 - 12.52.2 EagleNsembl
- 12.53 Enzymatics Inc
 - 12.53.1 Reagents
 - 12.53.2 SPARK DNA Sample Preparation Kit
- 12.54 Esoate SpA
 - 12.54.1 MyLabGamma
 - 12.54.2 MyLab GOLD Platform
 - 12.54.3 MyLab
 - 12.54.4 MyLab
 - 12.54.5 MyLab 25Gold

- 12.55 Eurofins MWG Operon Inc
 - 12.55.1 Products and Services
- 12.56 Exiqon A/S
 - 12.56.1 Products and Services
- 12.57 Fakuda Denshi Co., Ltd
 - 12.57.1 UF-400AX
 - 12.57.2 UF-550XTD
 - 12.57.3 UF-760AG
 - 12.57.4 UF-870AG
- 12.58 GATC Biotech AG
 - 12.58.1 Sanger Sequencing
- 12.59 GE Healthcare Ltd
 - 12.59.1 VScan
 - 12.59.2 VScan with Dual Probe
 - 12.59.3 Logiq P5
 - 12.59.4 Logiq P6
 - 12.59.5 GE Venue
 - 12.59.6 GE Venue
 - 12.59.7 Logiq S8
 - 12.59.8 Logiq E9
- 12.60 GenapSys Inc
 - 12.60.1 GENIUS
- 12.61 Gene by Gene Ltd
- 12.62 Genection Inc
- 12.63 GeneDx Inc
 - 12.63.1 Cytogenetics and Biochemical Tests
 - 12.63.2 Deletion/Duplication Analysis
 - 12.63.3 Carrier Mutation-Specific Testing
- 12.64 GenePeeks Inc
 - 12.64.1 Matchright Technology
- 12.65 Genesis Genetics
 - 12.65.1 GeniSeq24
 - 12.65.2 UltraPGD
 - 12.65.3 ArrayCGH
- 12.66 Genetadi Biotech S.L.
 - 12.66.1 AMNIOCHIP
 - 12.66.2 FERTICHIP
 - 12.66.3 PRENATAL GENE
- 12.67 Genoma Group Srl

- 12.68 Genomed AG
 - 12.68.1 Aneufast
- 12.69 GenPath Diagnostics
 - 12.69.1 InheriGen, InheriGen Plus and InheriGen Tx
 - 12.69.2 Prenatal Tests
- 12.70 Genway Biotech Inc
- 12.71 Good Start Genetics Inc
 - 12.71.1 EmbryVu
- 12.72 Hitachi Medical Systems America Inc
 - 12.72.1 Arietta
 - 12.72.2 ProSound Alpha
 - 12.72.3 Noblus
 - 12.72.4 ProSound F37
- 12.73 Hologic Inc
 - 12.73.1 InPlex CF Molecular Test
 - 12.73.2 Rapid fFN Test
- 12.74 Illumina Inc
 - 12.74.1 The Verifi Prenatal Test
- 12.75 INEX Innovations Exchange Pte Ltd
 - 12.75.1 iGene
 - 12.75.2 FlashFISH
 - 12.75.3 INEX's Collaborative Agreement with BGI
- 12.76 Invitae Corp
- 12.77 Laboratory Corporation of America Inc
 - 12.77.1 Services
- 12.78 LifeCodexx AG
 - 12.78.1 Prena Test
- 12.79 Monobind Inc
 - 12.79.1 Fertility VAST Panel: HCG, FSH, LH, SPRL
 - 12.79.2 PAPP-A Test
- 12.80 Multiplicom NV
 - 12.80.1 Clarigo
- 12.81 Myriad Genetics
- 12.82 Natera Inc
 - 12.82.1 Panorama Prenatal Screen
 - 12.82.1.1 Accuracy of Panorama Test
 - 12.82.1.2 Minimal False Negatives in Panorama
 - 12.82.2 Horizon Carrier Screening
 - 12.82.3 Spectrum Preimplantation Test

- 12.82.4 Natera's 24-chromosome PGS
- 12.82.5 Anora Miscarriage Test
- 12.82.6 Prenatal Paternity Test
- 12.82.7 Agreement between Natera and LifeLabs
- 12.83 Natus Medical Inc
 - 12.83.1 ABaer
 - 12.83.2 Algo
 - 12.83.3 Algo 3i
 - 12.83.4 AuDX
 - 12.83.5 Echo-Screen III
- 12.84 NewGene Ltd
 - 12.84.1 Hereditary Disorders
 - 12.84.2 Alport Syndrome
 - 12.84.3 Aortopathy Panel
 - 12.84.4 RASopathy Gene Panel
 - 12.84.5 Familial Hypercholesterolaemia
- 12.85 NIPD Genetics Ltd
 - 12.85.1 VERACITY Test (NIPT)
- 12.86 Oxford Gene Technology (OGT)
 - 12.86.1 SureSeq NGS Library Preparation Kit
 - 12.86.2 CytoSure Embryo Screen Array
 - 12.86.3 Cytocell FISH Probes
 - 12.86.4 CytoSure Embryo Screen Array
 - 12.86.5 CytoSure Aneuploidy Array
 - 12.86.6 CytoSure Chromosome X Arrays
- 12.87 Parabase Genomics Inc
 - 12.87.1 NewbornDx Test
- 12.88 Pathway Genomics Corp
 - 12.88.1 Carrier Screening
- 12.89 PerkinElmer Life and Analytical Sciences Inc
 - 12.89.1 DELFIA Xpress PIGF Assay
 - 12.89.2 DELFIA Xpress PAPP-A Kit
 - 12.89.3 AutoDELFIA PAPP-A Kit
 - 12.89.4 StepOne Newborn Screens
- 12.90 Premaitha Health PLC
 - 12.90.1 IONA Test
 - 12.90.2 Premaitha's Investment Agreement with Thermo Fisher
- 12.91 Progenity Inc
 - 12.91.1 nxtPanel Test

- 12.91.2 Verifi Test
- 12.91.3 Acquisition of Carmenta Bioscience by Progenity
- 12.92 Qiagen N.V.
 - 12.92.1 Next-Generation Sequencing (NGS)
 - 12.92.2 Target Enrichment Solutions
 - 12.92.3 Library Construction
- 12.93 Quest Diagnostics Inc
 - 12.93.1 QNatal Advanced
 - 12.93.2 Inhibin A
- 12.94 Ravgen Inc
 - 12.94.1 Prenatal Downs Syndrome Testing
 - 12.94.2 Single Gene Disorder Testing
- 12.95 Recombine Inc
 - 12.95.1 CarrierMap
- 12.96 Reproductive Genetics Institute Inc
- 12.97 Reprogenetics Laboratories
 - 12.97.1 Array CGH (aCGH)
 - 12.97.2 Single Gene Disorder Testing
 - 12.97.3 WaferGen Biosystems' Supply Agreement with Reprogenetics
- 12.98 Sebia Inc
- 12.99 Sequenom Inc
 - 12.99.1 MaterniT GENOME Test
 - 12.99.1.1 Sensitivity and Specificity of MaterniT GENOME Test
 - 12.99.2 MaterniT21 PLUS
 - 12.99.2.1 Sensitivity and Specificity of MaterniT21 PLUS
 - 12.99.3 HerediT UNIVERSAL Carrier Screen
 - 12.99.4 VisibiliT Prenatal Test
 - 12.99.5 HerediT Cystic Fibrosis Carrier Screen
 - 12.99.5.1 Clinical Data for HerediT
 - 12.99.6 SensiGene Fetal RHD Genotyping
 - 12.99.7 NextView Prenatal Diagnostic Tests
- 12.100 SeraCare Life Sciences Inc
 - 12.100.1 Seraseq Trisomy 21 Aneuploidy Reference Material
- 12.101 Siemens Healthcare
 - 12.101.1 Acuson S2000
 - 12.101.2 Acuson X700
 - 11.101.3 Acuson X600
 - 12.101.4 Acuson X300 PE
 - 12.101.5 Acuson X150

- 12.101.6 Acuson Antares
- 12.101.7 Acuson P300
- 12.102 Sophia Genetics SA
 - 12.102.1 Clinical Genomic Modules
- 12.103 SpOtOn Clinical Diagnostics Ltd
 - 12.103.1 Newborn Screening
 - 12.103.2 Ante-Natal Testing
- 12.104 Stra Biotech GmbH
- 12.105 Sygnis AG
 - 12.105.1 TruePrime Single Cell WGA Kit
 - 12.105.2 TruePrime WGA Kit
 - 12.105.3 TruePrime RCA Kit
 - 12.105.4 SunScript Reverse Transcriptase RNaseH+ and RNaseH- Kits
 - 12.105.5 SensiPhi/QualiPhi
- 12.106 SynapDx Corporation
 - 12.106.1 ASD Diagnosis
- 12.107.1 Thermo Fisher's Brands
- 12.108 Transgenomic Inc
 - 12.108.1 Technology Suite
 - 12.108.2 MX-ICP Technology
 - 12.108.3 ICEme Kit
 - 12.108.4 Other Products
- 12.109 Trivitron Healthcare Private Ltd
- 12.110 Trovagene Inc
 - 12.110.1 PCM BRAF V600E Mutation Detection Test
 - 12.110.2 PCM KRAS Mutation Detection Test
 - 12.110.3 PCR EGFR Mutation Detection Test
 - 12.110.4 HPV HR Detection Test
- 12.111 Tute Genomics Inc
 - 12.111.1 Tute Platform
- 12.112 Warp Drive Bio LLC
 - 12.112.1 Wrap's New Approach
 - 12.112.2 Chemomemes
 - 12.112.3 Genomic Search Engine
- 12.113 ZS Genetics Inc
 - 12.113.1 3G Sequencing
- 12.114 Zymo Research Corporation
 - 12.114.1 DNA Methylation Products
 - 12.114.1.1 Bisulfite Conversion

- 12.114.1.2 Methylated DNA Standards
- 12.114.1.3 DNA Methyltransferases
- 12.114.1.4 5-mC ELISA
- 12.114.1.5 5-mC Antibodies and Immunoprecipitation
- 11.114.1.6 Region-Specific DNA Methylation Analysis
- 12.114.1.7 Global 5-mC Quantification
- 12.114.1.8 Genome-wide 5-mC Analysis
- 12.114.2 DNA Purification Products
 - 12.114.2.1 DNA Clean-up
 - 12.114.2.2 Plasmid DNA Purification
 - 12.114.2.3 Genomic DNA
 - 12.114.2.4 Microbial and Environmental DNA Isolation
 - 12.114.2.5 DNA/RNA Co-Purification
 - 12.114.2.6 Sample Collection and Stabilization
 - 12.114.2.7 DNA Ladders
 - 12.114.2.8 Enzymes
 - 12.114.2.9 High-Throughput/Automated Isolation
 - 12.114.2.10 DNA Analysis Kits
- 12.114.3 Other Products

APPENDIX

Appendix 1: Representative Companies in Prenatal and Maternal Diagnostics and their Products

Appendix 2: Sources for Tables and Graphs

Index Of Figures

INDEX OF FIGURES

Figure 1.1: Summary of Prenatal Screening, Prenatal Diagnosis, Newborn Screening and PGS/PGD Markets, Through 2021

Figure 2.1: Risk of Down Syndrome and Chromosomal Abnormalities Due to AMA

Figure 2.2: Maternal Age and Pregnancy Loss Rate

Figure 2.3: Risk of Cesarean Section with Increasing AMA

Figure 2.4: Risk of Gestational Diabetes with AMA

Figure 2.5: Risk of Placenta Previa with AMA

Figure 2.6: Delayed First Pregnancy in the U.S

Figure 2.7: First Birth Rates for 35-39 Aged U.S. Women by Race

Figure 2.8: Pre-Existing Chronic Diseases among Women of Reproductive Ages in the U.S.

Figure 2.9: Chronic Disease Risk Behaviors and Risk Factors among Women of Reproductive Ages in the U.S

Figure 2.10: Prevalence of Preeclampsia during Pregnancy by Race/Ethnicity in the U.S.

Figure 2.11: Prevalence of Preeclampsia by Maternal Age in the U.S

Figure 2.12: Prevalence of Gestational Diabetes by Maternal Age in the U.S

Figure 2.13: Prevalence of Gestational Diabetes by Maternal Race/Ethnicity in the U.S.

Figure 2.14: Causes of Preterm Labor

Figure 2.15: Prevalence of Preterm Births in the U.S. by Stage

Figure 2.16: Prevalence of Preterm Births in the U.S. by Race/Ethnicity

Figure 2.17: Prevalence of Preterm Births in the U.S. by Plurality of Birth

Figure 2.18: Prevalence of Preterm Births in the U.S. by Maternal Age

Figure 2.19: Prevalence of Multiple Births in the U.S

Figure 3.1: Inheritance of Autosomal Dominant Faulty Gene When One Parent is a Carrier

Figure 3.2: Inheritance of Autosomal Dominant Faulty Gene When Both Parents are Carriers

Figure 3.3: Percent of Patients taking Sweat Chloride Test Reported in the U.S. Registry

Figure 3.4: Age at CF Diagnosis for all People Reported in the U.S. Registry, 2013

Figure 3.5: Distribution of Race/Ethnicity among People with CF in the U.S., 2013

Figure 3.6: Percent of New CF Diagnosis in U.S. Newborn Screenings, 1990-2013

Figure 3.7: The Six Most Common CFTR Mutations in the U.S

Figure 3.8: Autosomal Recessive Inheritance when Both Parents are Carriers

Figure 3.9: Autosomal Recessive Inheritance with Carrier Mother and Non-Carrier Father

Figure 3.10: Autosomal Recessive Inheritance from Homozygous Recessive Mother and Carrier Father

Figure 3.11: Autosomal Recessive Inheritance from Two Affected Parents

Figure 3.12: Inheritance Pattern of Sex-Linked Dominant Disorder with Affected Mother and Carrier Father

Figure 3.13: X-Linked Recessive Inheritance with a Carrier Mother and Non-Carrier Father

Figure 3.14: X-Linked Recessive Inheritance with Normal Mother and Affected Father

Figure 3.15: Incidence of Down Syndrome by Maternal Age in the U.S

Figure 3.16: Prevalence of Trisomies in the U.S

Figure 3.17: Relative Frequencies of Chromosomal Anomalies in Spontaneous Abortions

Figure 3.18: Maternal Age and Chromosomal Aneuploidy Detected at Amniocentesis

Figure 5.1: Genetic Disorders (%) Detectable by Prenatal Testing Methods

Figure 5.2: Nuchal Translucency as Seen in an Ultrasound Scan

Figure 5.3: The Amniocentesis Procedure

Figure 5.4: Chorionic Villus Sampling Procedure

Figure 5.5: Transvaginal CVS Procedure

Figure 5.6: Decline in Number of Amniocentesis at Yale New Haven Hospital and Bridgeport Hospital in the U.S. between 2011 and 2013

Figure 5.6: Scheme for Isolating Intact Fetal Cells for Prenatal Genetic Diagnosis

Figure 6.1: Number of Newborn Genetic Diseases Screened in Selected Countries

Figure 6.2: The Top Four Countries with Homocystinuria Population (per 100,000)

Figure 7.1: Indications for PGD

Figure 8.1: Markings on the Test Strip

Figure 8.2: Procedure of β -hCG Test

Figure 8.3: Interpretation of β -hCG Test Result

Figure 8.4: Fetal Karyotype Showing Trisomy 21 (Down Syndrome)

Figure 8.5: Peak Heights Indicating Aneuploidy in QF-PCR Study

Figure 8.6: Diagrammatic Representation of Steps Involved in FISH Test

Figure 8.7: FISH Test Showing Chromosomal Deletion

Figure 8.8: Steps Involved in Array-CGH

Figure 8.9: History of Innovations in NIPTs from 2011-2015

Figure 8.10: Detection Rate of Harmony Test Compared with Traditional Maternal Serum Tests

Figure 8.11: Global Availability of NIPTs

Figure 8.12: Preference of NIPTs by Pregnant Women at Santa Clara Valley Medical Center

Figure 8.13: Patient-Directed Model of Integrating NIPTs into Healthcare Setting

Figure 8.14: Growing Popularity of CRISPR-Cas9 Kits

Figure 9.1: Global Carrier Screen Test Market 2015-2020

Figure 9.2: Geographical Breakdown of Carrier Screen Test Market, USA, EU, RoW 2015-2020

Figure 9.3: Ultrasound Imaging Market Share (%) by Clinical Application

Figure 9.4: Global Market for Fetal Ultrasound Screening by Geography (U.S., Europe, RoW), Through 2021

Figure 9.5: Global Fetal Ultrasound Market Share by Company, 2014

Figure 9.6: Global Market for MRI Prenatal Screening by Geography (U.S., Europe, RoW), Through 2021

Figure 9.7: Global Market for Maternal Serum Screening Tests by Geography (U.S., Europe, RoW), Through 2021

Figure 9.8: Share of NIPTs Market by Geography (North America, Europe, RoW)

Figure 9.9: Global Market for NIPTs by Geography (North America, Europe, RoW), Through 2021

Figure 9.10: Global Market for NIPTs by Product

Figure 9.11: Global Market for Prenatal Invasive Diagnostic Tests by Geography (U.S., Europe, RoW), Through 2021

Figure 9.12: Global Market for Newborn Screening, Through 2021

Figure 9.13: Global Market for Newborn Screening by Technology, Through 2021

Figure 9.14: Global Market for MS/MS in Newborn Screening, Through 2021

Figure 9.15: Global Market for Pulse Oximetry in Newborn Screening, Through 2021

Figure 9.16: Global Market for Enzyme-Based Assays in Newborn Screening, Through 2021

Figure 9.17: Global Market for DNA Assays in Newborn Screening, Through 2021

Figure 9.18: Global Market for Electrophoresis in Newborn Screening, Through 2021

Figure 9.19: Geographical Share of PGS/PGD Market

Figure 9.20: Global Market for PGS/PGD by Geography (North America, Europe, RoW)

Figure 10.1: Global Market for Molecular Diagnostics, Through 2021

Figure 10.2: Global Market for Liquid Biopsy by Geography (North America, Europe, RoW), Through 2021

Table 10.3: Global Market for Personalized Medicine by Business Segment, Through 2021

Figure 10.4: Percent Share of IVD Market by Business Segments

Figure 10.5: Global IVD Market by Geography (North America, Europe, RoW), Through 2021

2021

Figure 12.1: Comparison of False Negative Rates

Figure 12.2: Sensitivity and Specificity of MaterniT GENOME Test

Index Of Tables

INDEX OF TABLES

Table 1.1: Summary of Prenatal Screening, Prenatal Diagnosis, Newborn Screening and PGS/PGD Markets, Through 2021

Table 2.1: Risk of Down Syndrome and Chromosomal Abnormalities Due to AMA

Table 2.2: Maternal Age and Pregnancy Loss Rate

Table 2.3: Risk of Cesarean Section with Increasing AMA

Table 2.4: Risk of Gestational Diabetes with AMA

Table 2.5: Risk of Placenta Previa with AMA

Table 2.6: Delayed First Pregnancy in the U.S

Table 2.7: First Birth Rates for 35-39 Aged U.S. Women by Race

Table 2.8: Maternal and Fetal Concerns due to Pre-Existing Maternal Medical Issues

Table 2.9: Pregnancy Outcome in Women with Renal Diseases

Table 2.10: Pregnancy Outcome in Women with Pre-Existing Thyroid Disease

Table 2.11: Risks Associated with Obesity in Pregnant Women

Table 2.12: Pregnancy Complications in Asthmatic Women

Table 2.13: Pregnancy Complications and Neonatal Outcome in Women with Epilepsy

Table 2.14: Maternal and Fetal Complications in Women with Autoimmune Diseases

Table 2.15: Complications due to Hemoglobinopathies in Pregnancy

Table 2.16: Prevalence of Gestational Diabetes in the U.S

Table 2.17: Countries with Higher and Lower Rates of Preterm Births

Table 2.18: Prevalence of Preterm Births in the U.S. by Stage

Table 2.19: Prevalence of Preterm Births in the U.S. by Race/Ethnicity

Table 2.20: Prevalence of Preterm Births in the U.S. by Plurality of Birth

Table 2.21: Prevalence of Preterm Births in the U.S. by Maternal Age

Table 2.22: Related Complications of Placenta Previa

Table 2.23: Mode of Delivery for Breech Presentation

Table 2.24: Perinatal Outcome due to Meconium Stained Liquor

Table 2.25: Pregnancy Outcome due to Polyhydramnios

Table 2.26: Causes of Fetal Growth Restriction

Table 2.27: Prevalence of Congenital Cardiovascular Diseases in the U.S

Table 3.1: Worldwide Prevalence of Huntington Disease by Selected Country

Table 3.2: Prevalence of 25 Most Common CFTR Mutations in the U.S., 2013

Table 3.3: Molecular Diagnostic Tests for Canavan Disease

Table 3.4: Incidence of Sickle Cell Disease in the U.S

Table 3.5: Red Blood Cell Indices in Beta-Thalassaemia

Table 3.6: Molecular Genetic Tests for Beta-Thalassaemia

Table 3.7: Chances of Inheriting a Single Gene Disorder
Table 3.8: More Common Recessive Disease Traits in Selected Ethnic Groups
Table 3.9: A Comprehensive List of Genetic Disorders
Table 3.10: Turnaround Time and Average Cost for Hemophilia Genetic Tests
Table 3.11: Incidence of Chromosomal Abnormalities
Table 3.12: Karyotypes Commonly Associated with Klinefelter Syndrome
Table 3.13: Features of Turner Syndrome in Different Age Groups
Table 3.14: Some Complications of Trisomy 21 (Down Syndrome)
Table 3.15: Incidence of Down Syndrome by Maternal Age
Table 3.16: Developmental Delay in Children with Down Syndrome
Table 3.17: Frequently Observed Anomalies in Babies with Trisomy
Table 3.18: Common Clinical Features of Trisomy
Table 3.19: Congenital Anomalies Associated with Triploidy
Table 3.20: Relative Frequencies of Different Chromosomal Anomalies in Spontaneous Abortions
Table 3.21: Maternal Age-Related Frequencies of Aneuploid Fetuses Detected Prenatally
Table 3.22: Clinical Features of Common Chromosomal Aneuploidy
Table 3.23: Maternal Age and Chromosomal Aneuploidy
Table 3.24: Sensitivity and Specificity of Maternal Serum and Ultrasound Tests for Aneuploids
Table 3.25: Common Autosomal Deletions, Resulting Syndromes and Clinical Features
Table 3.26: Common Autosomal Microdeletion Syndromes
Table 3.27: Commonly Encountered Problems in Prader-Willi Syndrome
Table 3.28: Tests for Prader-Willi Syndrome
Table 3.29: Molecular Genetic Tests for CATCH 22 Syndrome
Table 3.30: Autosomal Duplication Syndromes
Table 3.31: Molecular Genetic Tests for Beckwith-Wiedemann Syndrome
Table 3.32: Molecular Diagnostic Tests for CMT1A
Table 4.1: Genetic Counseling Services by DTC GT Companies
Table 4.2: A List of Genetic Counseling Companies and Their Websites
Table 5.1: Major Prenatal Screening Tests during the First and Second Trimesters
Table 5.2: Other Routine and Non-Routine Prenatal Screening Tests
Table 5.3: hCG Levels from Date of Conception to 40th Week
Table 5.4: Selected β -hCG Kits and Manufacturers
Table 5.5: Selected PAPP-A Kits and Manufacturers
Table 5.6: Selected MSAFP Test Kits and Manufacturers
Table 5.7: Selected uE3 Test Kits and Manufacturers
Table 5.8: Selected Inhibin-A Test Kits and Manufacturers

Table 5.9: Selected Hexosaminidase Test Kits and Manufacturers
Table 5.10: Comparison of the Four Maternal Serum Screening Analyte Patterns
Table 5.11: The Five Popular Commercially Available Noninvasive Prenatal Tests (NIPTs)
Table 5.12: Sensitivity and Specificity of NIPTs
Table 5.13: Diagnostic Applications of cffDNA
Table 5.14: Time of Availability of cffDNA in Maternal Blood
Table 5.15: The Costs of NIPTs by Region/Country
Table 5.16: Costs of NIPTs by Product in the U.S
Table 5.17: History of Aneuploidy Screening
Table 5.18: NIPT Methods for Detecting Aneuploidy
Table 5.19: Comparison of Amniocentesis and NIPTs
Table 5.20: Advantages and Disadvantages of NIPTs
Table 5.21: Comparison of Performance Criteria for Commonly Used Prenatal Tests
Table 5.22: Comparison of NIPT Detection Rates with Traditional Tests
Table 5.23: False Positive Rates of NIPTs Compared with those of Traditional Tests
Table 5.24: Different Applications of Ultrasound in Different Trimesters
Table 5.25: MRI Indications for Prenatal Screening when Ultrasound Screening is Inadequate
Table 5.26: Prenatal Diagnostic Tests by Pregnancy Stage
Table 5.27: Comparison of CVS and Amniocentesis
Table 5.28: Advantages and Disadvantages of Prenatal Diagnostic Tests
Table 5.29: Comparison of Prenatal Tests using Cell-Free Fetal DNA (cffDNA) and Intact Fetal Cells from Maternal Blood
Table 6.1: Thirty One Core Conditions Detected During Newborn Screening
Table 6.2: Categories of Newborn Genetic Disorders
Table 6.3: Metabolic Genetic Disorders Detectable by MS/MS and their Scores
Table 6.4: Incidence of PKU by Region
Table 6.5: Molecular Genetic Tests for Biotinidase Deficiency
Table 7.1: Number of Genetic Disease States with Carrier Status
Table 7.2: Carrier Risk of Most Common Genetic Diseases by Ethnic Group
Table 7.3: Select Commercially Available Genetic Assays for Carrier Screening by Company and Diseases Detected
Table 7.4: Advantages and Disadvantages of Currently Available PGS/PGD Technologies
Table 7.5: Genetic Diseases Detected During PGS/PGD
Table 7.6: Currently Available Products for PGS/PGD
Table 7.7: Cost of in vitro Fertilization and Related Procedures
Table 8.1: Karyotype vs. Microarray

Table 8.2: The Format of FISH Test Result
Table 8.3: Some Commonly Used FISH-Based Tests
Table 8.4: Microdeletions/Microduplications Detectable by FISH
Table 8.5: FISH Probes and Functions
Table 8.6: Presentation Format of Array-CGH Test Report
Table 8.7: Harmony vs. Traditional Down Syndrome Tests
Table 8.8: Predictive Value, Sensitivity and Specificity of InformaSeq Test
Table 8.9: Detection Rates of Panorama Test
Table 8.10: NIFTY Test Options
Table 8.11: Clinical Data for IONA Test
Table 8.12: Sensitivity and Specificity of Verifi Test
Table 8.13: Sensitivity and Specificity of Verifi's Microdeletion Panel
Table 8.14: Comparison of MaterniT GENOME Test and Karyotype
Table 8.15: Sensitivity and Specificity of MaterniT GENOME Test
Table 8.16: MaterniT21 PLUS' Independent Validation
Table 8.17: The Three Panels Offered by HeridiT UNIVERSAL Carrier Screen
Table 8.18: Comparison of the Four Major NIPT Products available in the U.S. Market
Table 8.19: U.S. Patents for NIPTs by Company
Table 8.20: Selected Issued Patents of NIPTs
Table 8.21: Major U.S. Patents and Applications
Table 8.22: Countries in Which NIPT is currently Marketed
Table 8.23: Detection, Uptake, False Positive and Failure Rates for NIPTs
Table 8.24: Cost of Different Prenatal Screens
Table 8.25: Disease Types Targeted by Different Nuclease Platforms
Table 9.1: Global Carrier Screen Test Market 2015-2020 US\$ Million
Table 9.2: Geographical Carrier Screen Test Market 2015-2020 US\$ Millions, USA, EU, RoW
Table 9.3: Global Market for Fetal Ultrasound Screening by Geography (U.S., Europe, RoW), Through 2021
Table 9.4: Global Fetal Ultrasound Market Share by Company, 2014
Table 9.5: Global Market for MRI Prenatal Screening by Geography (U.S., Europe and RoW), Through 2021
Table 9.6: Global Market for Maternal Serum Screening Tests by Geography (U.S., Europe, RoW), Through 2021
Table 9.7: Global Market for NIPTs by Geography (North America, Europe, RoW), Through 2021
Table 9.8: Global Market for NIPTs by Product
Table 9.9: Global Market for Prenatal Invasive Diagnostic Tests by Geography (U.S., Europe, RoW), Through 2021

Table 9.10: Global Market for Newborn Screening by Technology, Through 2021

Table 9.11: Global Market for PGS/PGD by Geography (North America, Europe, RoW), Through 2021

Table 10.1: Global Market for Liquid Biopsy by Region (North America, Europe, RoW), Through 2021

Table 10.2: Global Market for Personalized Medicine by Business Segment, Through 2021

Table 10.3: Global IVD Market by Geography (North America, Europe, RoW), Through 2021

Table 11.1 Adoption Rates for Different Prenatal Tests in the U.S

Table 12.1: Financial Data for Affymetrix

Table 12.2: Selected Financial Data for Agilent Technologies

Table 12.3: Comparison of Harmony and Other Traditional Tests

Table 12.4: CombiSNP Prenatal Targeted Array Disorder List

Table 12.5: Genetic Tests Offered by Correlagen by Gene and Disease

Table 12.6: GeneDx's Cytogenetics and Biochemical Tests

Table 12.7: Hologic's Financial Data

Table 12.8: Performance of Verifi Test

Table 12.9: Verifi Prenatal Test Lab Partners in the U.S

Table 12.10: Illumina's Financial Data

Table 12.11: Comparison of Prenatal Test Performance

Table 12.12: Comparison of False Negative Rates

Table 12.13: A Small Sample of Diseases Screened by Horizon Test

Table 12.14: Natus Medical's Financial Data

Table 12.15: Clinical Data for IONA Test

Table 12.16: Sensitivity and Specificity of MaterniT GENOME Test

Table 12.17: Sequenom's Financial Data

Table 12.18: Sensitivity and Specificity of MaterniT21 PLUS Test

Table 12.19: Three Options Offered by HeridiT UNIVERSAL Carrier Screen

Table 12.20: Clinical Evaluation Performance of VisibiliT Prenatal Test

Table 12.21: CF Detection Rates for Standard and Expanded Panels

Table 12.22: Accuracy, Sensitivity and Specificity of SensiGene Fetal RHD

Table 12.23: NextView Diagnostic Test Platforms

Table 12.24: Trovagene's Financial Data

Table Ap. 1.1: Participating Companies and their Products and Services

I would like to order

Product name: Global Prenatal & Maternal Diagnostic Market to 2021

Product link: <https://marketpublishers.com/r/G1268D40A40EN.html>

Price: US\$ 3,800.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/G1268D40A40EN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:
Last name:
Email:
Company:
Address:
City:
Zip code:
Country:
Tel:
Fax:
Your message:

****All fields are required**

Customer signature _____

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970