

Global Hematology Analyzer Market: Industry Analysis and Forecast, 2016-2024

By

Hemanth Koduri

*Dissertation submitted for the partial fulfillment of the
MBA Pharmaceutical Management*

Academic year, 2015-2017



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TO WHOMSOEVER MAY CONCERN

This is to certify that Hemanth Koduri of MBA Pharmaceutical Management from The IIHMR University, Jaipur has undergone internship training at Future market insights, Pune from 6th February, 2017 to 12th May, 2017.

The Candidate has successfully carried out the study designated to his during internship training and his approach to the study has been sincere, scientific and analytical.

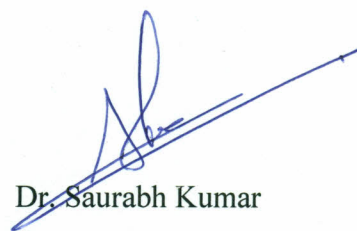
The Internship is in fulfillment of the course requirements.

I wish his all success in all his future endeavors.



(Col.) Dr. Ashok Kaushik

Dean, Academics and Student Affairs
The IIHMR University, Jaipur



Dr. Saurabh Kumar
Assistant Professor
The IIHMR University, Jaipur

May 5, 2017

TO WHOM IT MAY CONCERN

This is to certify that **Hemanth Koduri** pursuing **MBA - Pharmaceutical Management** from **The IIHMR University, Jaipur** has successfully completed Major Project/ Dissertation in our organization on the topic, **"Global Hematology Analyzers Market"** from **February 6, 2017 to May 12, 2017**.

During the project tenure in the organization, we found **Hemanth** is hard working, sincere and inquisitive.

We wish him all the best and success in his future endeavors.


Chief Operating Officer

THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **“Global Hematology Analyzer Market: Industry Analysis and Forecast, 2016-2024”** submitted by **Hemanth Koduri** Enrollment No. **IIHMR-U/01/2015-17/ 0038** under the supervision of **Dr. Saurabh Kumar** for award of **MBA Pharmaceutical Management** of the University carried out during the period from **6th February 2017 to 12th May 2017** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.

K. Hemanth.

Signature

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This is to certify that all ethical issues have been considered while collecting data for my dissertation titled **“Global Hematology Analyzer Market: Industry Analysis and Forecast, 2016-2024”**.

K. Hemant h.

Signature of student

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Hemanth Koduri

Executive summary

- ❑ Global Hematology Analyzer market revenue is expected to increase at a CAGR of 5.2% during the forecast period (2016–2024).
- ❑ In terms of revenue, 5 Part Differential Analyzer segment was the dominant Product type segment in the global Hematology Analyzer market in 2015. The segment is expected to further gain traction, owing to increasing adoption of 5 Part Differential Analyzer in developing countries.
- ❑ Increasing awareness of blood related disorders and blood donation globally is expected to boost demand for Hematology Analyzer Market.
- ❑ North America Hematology Analyzer market accounted for largest revenue market share of 33.3% in 2015. Revenue from the market in APAC Region is expected to register the fastest CAGR of 6.5% during the forecast period.

Drivers

- ❑ Increasing prevalence of chronic condition with lifestyle changes.
- ❑ Increasing awareness regarding chronic diseases.
- ❑ Increasing healthcare demand due to aging population.
- ❑ Changing government policies.

Challenges

- ❑ Macro-economic and geopolitical uncertainties.
- ❑ Uncontrolled Healthcare Expenditure.

- ☐ Excess and Obsolete Inventories
- ☐ Liquidity Risk

Trends

- ☐ Focus towards Innovation
- ☐ Optimization of Technologies
- ☐ Enhancing Utility & Automation

Overall Market Approach

Manufacturers: Focus on developing innovative products to retain market share

- ☐ For instance, key players in global Hematology Analyzer market are focusing on development of new Technological advancements with additional parameters.
- ☐ Adoption of innovative marketing strategy by Hematology Analyzer manufacturers to gain market share
- ☐ Increased focus on Point of Care Instruments by manufacturers owing to increasing penetration of Hematology Analyzer.
- ☐ Paradigm Shift from Semi-automatic to Automatic Hematology Analyzers increases the efficiency and Accuracy of results.

Target Geographies

- ☐ North America represents the most lucrative market, followed by Europe and APAC

- ❑ The Hematology Analyzer market in MEA is expected to record comparatively less growth due to less penetration of diagnostic procedures among key stake holders such as patients and healthcare professionals

Differentiating Strategy

- ❑ Manufacturers are focused on developing Advanced Analyzers with lower pricing, thus expecting to increase their respective market shares
 - The companies are focusing on outsourcing the manufacturing of Hematology Analyzers in APAC region in order to reduce their manufacturing costs and thus competing in the market with reduced prices
- ❑ Strengthening product portfolio through mergers and acquisitions
 - Companies are entering into mergers and acquisitions to expand product portfolio and market presence globally.

1. Introduction

1.1 Hematology Analyzer

- Hematology analyzer is quantitative, clinical laboratory instrument which provides a complete blood count, leukocyte differential count and reticulocyte analysis for in vitro diagnostic use.
- The simplest analyzer can perform multiple parameter analysis. The most basic analyzer performs 17 **Error! Reference source not found.** parameter analysis (even less that in few cases). By contrast, the advanced analyzers can measure up to 50 parameters or even more than that.
- Current hematology analyzers use a different combination of techniques like electrical impedance, light absorption, fluorescence, light scatter, and electrical conductivity methods to produce complete red blood cell, platelet, and leukocyte analyses. Presently used hematology analyzers are incorporated with flow cytometry which gives cell size, cell granularity and cell composition.
- Analyzers increases sensitivity and specificity by reducing the manually verification of abnormal or flagged patient results by combining different techniques (like combining the impedance, light transmission, cytochemistry, and fluoro-flow cytometry). This has improved the accuracy in counting, low-incidence cell and various immature cells.
- Hematology analyzer also provide information about bone marrow, which is the blood forming-tissue (Used to diagnosis). Conditions like anemia, acute and chronic illness, bleeding tendencies and white blood cell disorders can be diagnosed by Complete blood count and cell morphology.
- The Complete Blood Count and Differential Blood Count are used to diagnose during the last quarter century, blood cell analysis is progressed from the use of labor-intensive manual procedures to the use of highly automated instruments.

1.2 Working Principle:-

- The basic techniques used in hematology analyzers are: flow cytometry, fluorescent flow cytometry, and electrical impedance
- For example, electrical impedance is used to differentiate red blood cells (RBCs) from WBCs, and platelets by volume.

1. Electrical impedance:-

- Electrical impedance (also called as Coulter Principle) is a traditional method for counting cells. It is useful in most of the hematology analyzer.
- Electrical impedance instrument consists of two electrodes which is narrow aperture. So that one cell can be traverse through it at any time.
- As the cell passes through it, the impedance changes along with it. Impedance is recorded because it is corresponding to blood cell volume, resulting a cell counting (because different cell have different impedance) and volume measure.
- Electrical Impedance analysis is used for three-part WBC differentials analysis (i.e. granulocytes, lymphocytes, and monocytes) and complete blood count (CBC) but cannot differentiate between the similarly sized cells (granular leukocytes like eosinophil's, basophils, and neutrophil).
- Counting rates of electrical impedance is up to ten thousand cells per second can be achieved and it takes less than one minute for a typical electrical impedance analysis.

2. **Flow cytometry:-**

- Flow cytometry is more expensive than electrical impedance analysis technique, but it gives more detailed information about the blood cell morphology. It is used for determining five-part differentials of WBC along with CBC.
- When a blood sample passes through a beam of laser, the absorbance will change. This absorbance along with scattered light is measured to determine the granularity of cells, and diameter. It is the same technique like manual counting from the slide by observing characteristics of cell but manual technique is less accurate.

3. **Fluorescent:-**

- Specific cell population of blood can be determined by adding fluorescent reagent to the sample along with the flow cytometry. The ratio of nucleus-plasma of each stained cell can be revealed by fluorescent dyes. It is also useful for the platelets analysis, nucleated RBC and reticulocyte count.

3.3 **Product Overview**

The 3-part differential analyzer:-

- It is used to measure the volume of white blood cells electrically and classifies the cells, according to their size, into three types: lymphocytes (small WBC group), monocytes, eosinophils, and basophils (a medium-sized WBC group), and neutrophils (a large WBC group).
- 3-Part Differential Analyzer is compact, uses fewer reagents and is cost-effective, and can detect increased number of neutrophils more accurately than the 5-part differential analyzer.

- The 3-part differential analyzer is suited for Ambulatory surgical centers and Diagnostic centers, where acute inflammations must be identified promptly and reliably, and small laboratories attached to wards or operating rooms. This analyzer uses blood specimens treated with the anticoagulant EDTA (Ethylene diamine tetra acetic acid) and can be operated easily.
- The results of the CBC and the 3-part differential for WBC can be obtained within two minutes. They can be linked to a printer, the 3-part white cell differential chart (sorted by diameter) can be generated.
- The analyzer can operate in the microanalysis mode which is used when there is no sufficient quantity of blood sample is not obtained from patient (common with infants and children), the analyzer can operate properly in the microanalysis mode.
- Blood is screened in case of inflammations to determine the infection by bacterial origin (Mostly the count of WBC, neutrophil ratio, and CRP will increase)
- If there is normal or reduced number of WBC, normal or high C - reactive protein (CRP), and increase in lymphocyte causes inflammation indicates the presence of virus.
- Using Complete blood count, 3-part differential, and C - reactive protein, clinician determine the cause of the inflammation and characteristics of the disease.

The 5-part differential analyzer:-

- The 5-part differential analyzer can differentiate WBC into neutrophils, lymphocytes, monocytes, eosinophil's, and basophils.
- It is used for Multi-dimensional analysis like
 - Cell Complexity
 - DNA/RNA content

- Cellular content
 - Cell size but never in isolation
- The 5-part differential analyzer uses blood sample treated with the anticoagulant EDTA (same like 3 Part Differential) and can analyze the sample as fast as the 3-part differential analyzer.
- Compared with the 3-part differential analyzer, it is larger, more expensive, and with high maintenance cost. It is available in both open tube and closed tube for measurement.
- 5-part differential analyzers uses different combinations of high frequency electromagnetic energy, Electrical impedance, optical and cytochemical staining techniques for 5 Part WBC differentiation.
- When Blood sample is passed through the 5 Part Differential Analyzer flow cell, three measurements occur simultaneously :
 - One, volume of blood can be measured by low-frequency current.
 - Second, cellular internal content of cells can be measured high-frequency current by measuring changes in conductivity (Different cell have different conductivity).
 - Third, WBC cell cellular surface, shape, and reflectivity (cell morphology) can be measured by light scattering.

The 6-part differential analyzer:-

- The 6 part differential analyzer is used for measurement of immature granulocytes (IG) along with 5 varieties of WBC i.e. neutrophils, lymphocytes, monocytes, eosinophil's, and basophils.

- Higher nucleic acid content in comparison with mature granulocytes is used for identification of immature granulocytes by using fluorescence flow cytometry of 6 part Differential Analyzer. Promyelocytes, myelocytes and metamyelocytes are types of Immature Granulocyte but not band cells.
- The presence of immature granulocytes is always indicates the presence of pathological condition with the exception in case of immediate post-partum period and a neonate less than three days old (because in both conditions immature granulocytes are considerably high). The precision of the automated Immature Granulocytes count is better than manual microscopy making it ideal for monitoring of patients thereby eliminating labor intensive manual counting.

3.3.1.1 Parameters:-

WBC, RBC, HGB, HCT, MCV, MCH, MCHC, RDW, PLT, MPV, PCT, PDW %, NEU, LYM, MON, EOS, BAS, ALY, LIC , IMM, IML,IMG: (% and #), RET (% and #), RETH %, RETM %, RETL %,IMR %,CRC%,IRF, MRV,RHCc, MFI, NRBC % , NRBC#, CWBC , WBC#, RBC#, PolyNuc#, MonoNuc#, IG.

3.4 Guidelines –Hematology Analyzers

FDA Guidelines:-

Hematology Analyzers comes under class 2 devices

Special Controls

- Special controls are regulatory requirements for class II devices. FDA classifies into class II devices for which general controls alone are insufficient to provide reasonable

assurance of the safety and effectiveness of the device, and for which there is sufficient information to establish special controls to provide such assurance.

Special controls are usually device-specific and include:

- Performance standards
- Postmarket surveillance
- Patient registries
- Special labeling requirements
- Premarket data requirements
- Guidelines

European GuidelinesError! Reference source not found.Error! Bookmark not defined.:-

- Whereas the major part of medical devices are covered by Council Directive 90/385/EEC of 20 June 1990 on the approximation of laws relating to active implantable medical devices (2) and Council Directive 93/42/EEC of 14 June 1993 concerning medical devices (3) with the exclusion of in vitro diagnostic medical devices; whereas this Directive seeks to extend the harmonisation to in vitro diagnostic medical devices and whereas, in the interest of uniform Community rules, this Directive is based largely on the provisions of the said two Directives;
- Whereas, in Decision 93/465/EEC of 22 July 1993 concerning the modules for the various phases of the conformity assessment procedures and the rules for the affixing and use of the CE conformity marking, which are intended to be used in the technical harmonisation directives (2), the Council laid down harmonized conformity assessment procedures;
- Whereas medical devices should, as a general rule, bear the CE marking indicating their conformity with the provisions of this Directive to enable them to move freely within the Community and to be put into service in accordance with their intended purpose;

Japan: Ministry of Health Labor and Welfare (MHLW) Guidelines

Japan registration requirements for IVDs

- Pre-market Certification (*Ninsho*). To register and market most Class II IVDs, the D-MAH/MAH (Designated Market Authorization Holder) needs to file a Pre-Market Certification application with a Registered Certification Body (RCB), e.g., BSI (British Standard Institution), TUV (Technical Inspection Association), SGS (Société Générale de Surveillance) etc., and obtain their certification. Several European Notified Bodies are also Japanese RCBs.

Hematology analyzer market: Segmentation

Segmentation based on product

- 3-part differential hematology analyzer
- 5-part differential hematology analyzer
- 6-part differential hematology analyzer

Segmentation based on modality

- Standalone Analyzers
- Point of care Analyzers

Segmentation based on End users

- Hospitals
- Diagnostic Centers
- Ambulatory Surgical centers
- Blood Banks

Segmentation based on Region

- North America
- Latin America
- Europe
- APAC (Asia & Pacific)
- MEA (Middle East & Africa)

2. Need for Study

Changing lifestyles pattern like tobacco use, overuse of alcohol, a lack of regular exercise and consumption of improper diet with high saturated fats, sugar etc. Cumulatively, these leads to increased prevalence of chronic diseases and tend to impact quality of life in developed and developing economies just the same. Because chronic conditions require medical attention. Because of this, there is a high need for monitoring the blood to understand chronic diseases. So, there is a high demand for hematology analyzers to test the blood. This demand attracts more manufacturers towards the hematology analyzer market and increasing the alternative product lines and competitiveness.

The study is useful to:

- ✓ Understand the market scenario of the Hematology Analyzers.
- ✓ Understand drivers and restraints of the market
- ✓ Give ideas about market share of the product, modality, end user and region wise segments respectively.

3. Research Question

- What is the market potential of Global Hematology Analyzers?

4. Objectives

- To identify the market potential of global hematology analyzers
- To identify market attractiveness of all segments
- To find out the dominant region in the global Hematology Analyzer Market
- To identify the Opportunities and Trends of the Market

5. Methodology

5.1 Study Method

Secondary Research

5.2 Study type

Retrospective study

Sample size

41 reports and 20 articles

Inclusion Criteria

Hematology analyzers articles, global trends, annual report of the companies, SEC filing of the companies, In-vitro diagnostic guidelines, FDA, EMEA and PMDA

Exclusion Criteria

Newsletters, corporate presentations

5.3 Data collection

Secondary data

Secondary data- Historical data is collected from various corporate filling like annual report of the companies and U.S. Securities and Exchange Commission (SEC). Other

sources include balance sheets, sales figures, Inventory record, and previous marketing research studies.

5.4 Research Instrument (tools and techniques)

The data is collected by historical trend examination and thorough secondary research. M.S Excel is used for statistical analysis and CAGR (Calculated from historical data) used to for forecasting (Forecasting period 2016-2024).

5.5 Study duration

3 months (6st

6. Data Analysis (Findings & Inferences)

6.1 Estimated & Forecasted global Hematology Analyzer Market Value (US\$ Mn), 2015–2024

- The global Hematology Analyzer market is anticipated to expand at a CAGR of 5.2% between 2016 and 2024.
- Increasing prevalence of diseases require continuous diagnosis for controlling the diseases, which is expected to boost demand for Hematology Analyzer market over the forecast period.

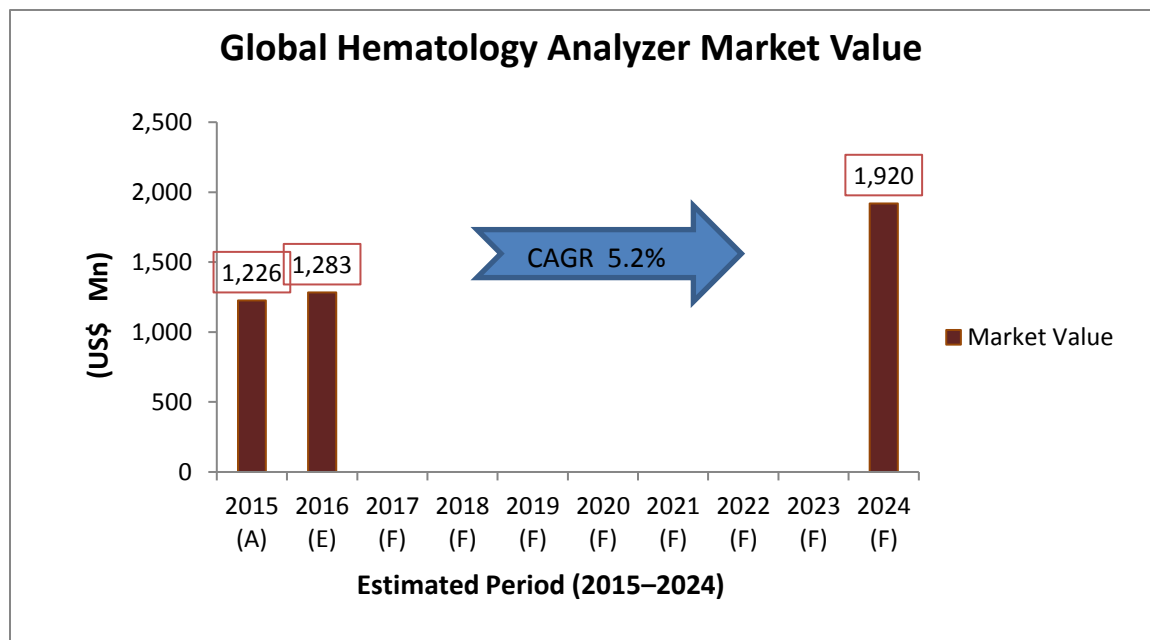


Figure 1: Estimated & forecasted global hematology analyzer market value

6.2 Estimated & forecasted global Product Segment Share, 2015–2024

- 3 Part Differential Analyzer segment is owing to the stable growth during the forecast period.
- 5 Part Differential Analyzer segment is expected to account for major revenue share of the global Hematology Analyzer market.
- 6 Part Differential Analyzer segment is owing to the increased adoption of 6 Part Differential Analyzer during the forecast period.

Estimated Global Product Segment share, 2016

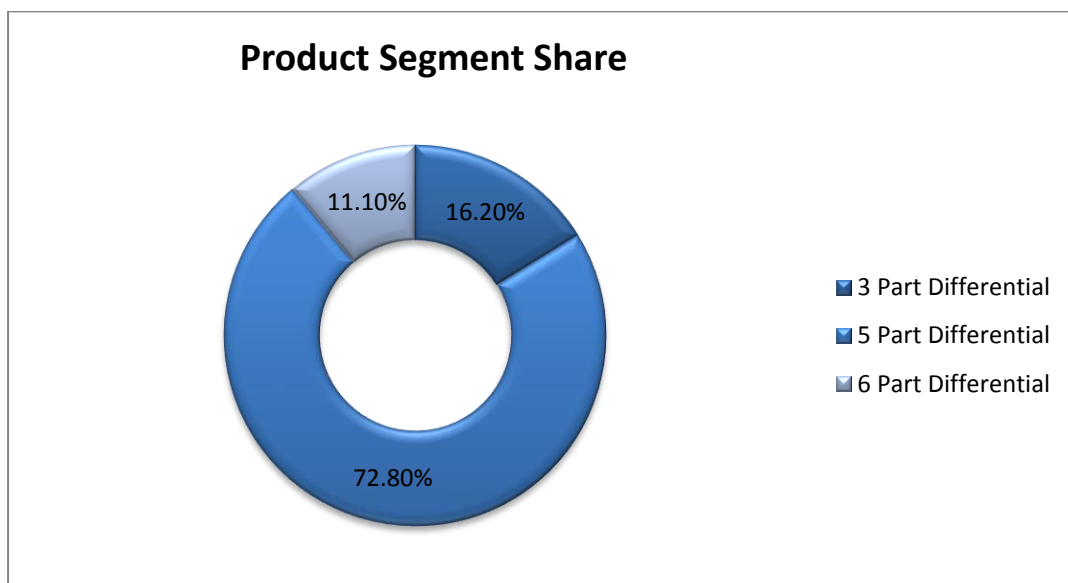


Figure 2 : Estimated global hematology analyzer product share

Forecasted Global Product Segment share, 2024

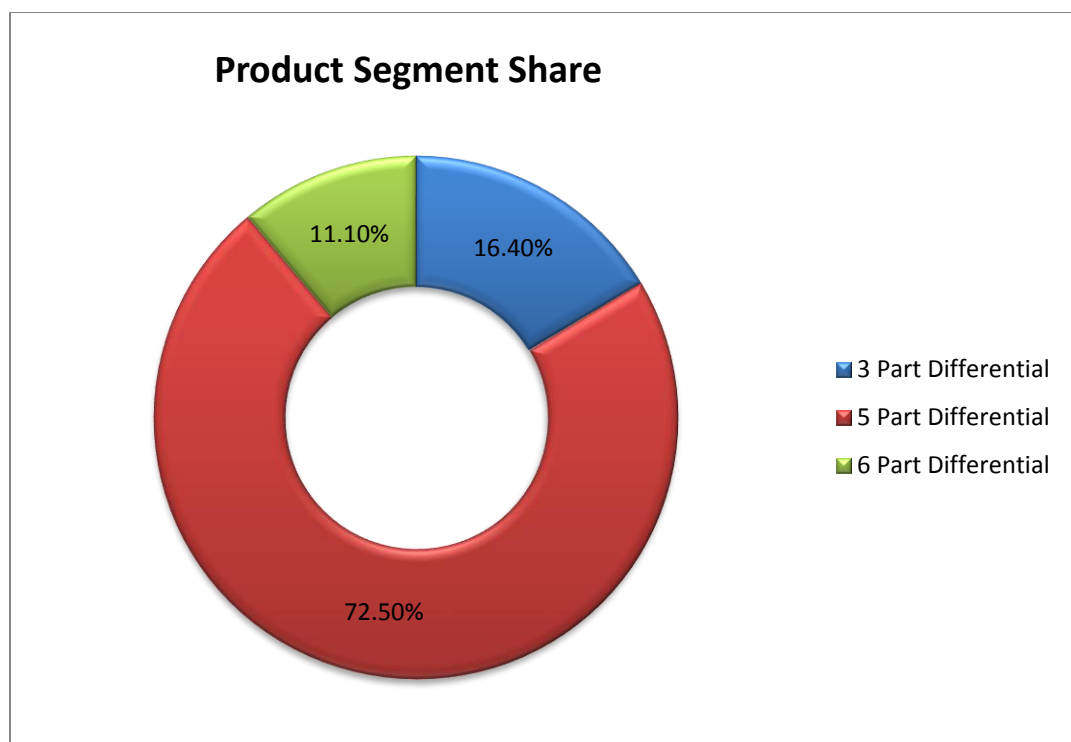


Figure 3: Forecasted global hematology analyzer product share

6.3 Estimated & forecasted global Product Segment Value (US\$ Mn), 2015–2024

- 3 Part Differential Analyzer segment is anticipated to expanding at a same pace over the forecast period.
- The increases in the application rate of 3 part differential analyze due to its low cost is expected to boost the demand over the forecast period.

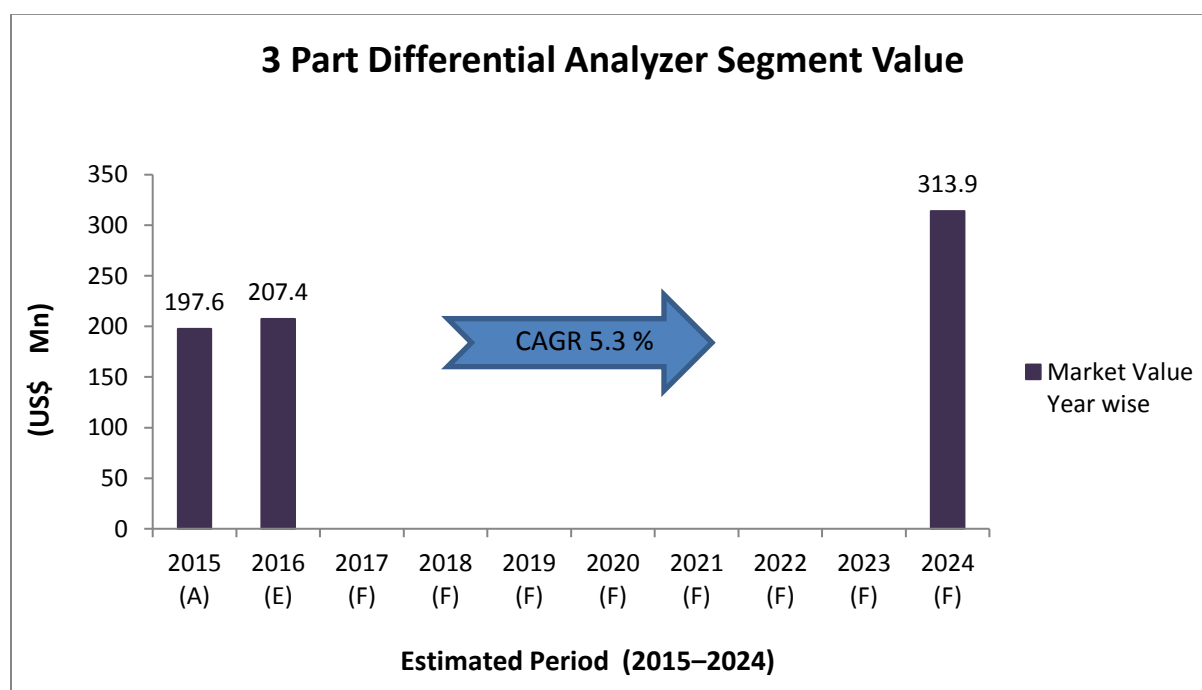


Figure 4 : Estimated and forecasted 3 Part Differential analyzer segment value

6.4 Estimated & forecasted global 5 Part Differential Analyzer Segment Value (US\$ Mn), 2015–2024

- The demand for 5 Part Differential Analyzer is expected to increase over the forecast period owing to increasing acceptance in emerging countries.

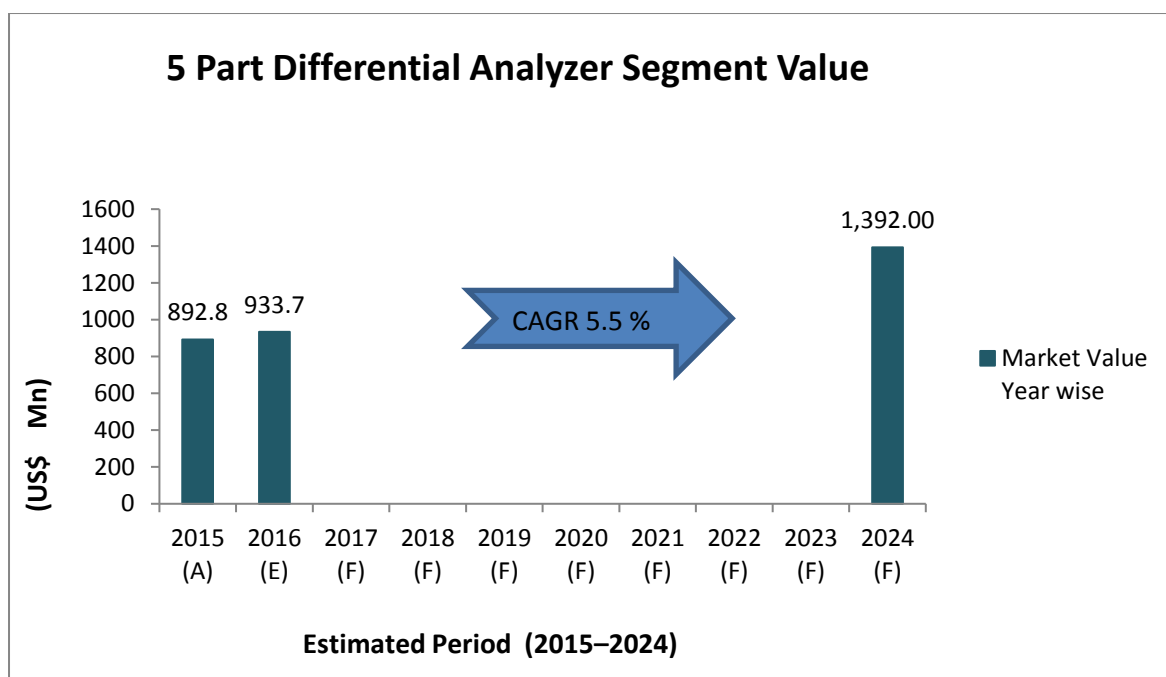


Figure 5: Estimated and forecasted 5 part differential analyzer segment value

6.5 Estimated & forecasted Global 6 Part Differential Analyzer Segment Value (US\$ Mn), 2015–2024

- The demand for 6 Part Differential Analyzer is expected to increase over the forecast period owing to technological advancements of 6 Part Differential over the other two product types.

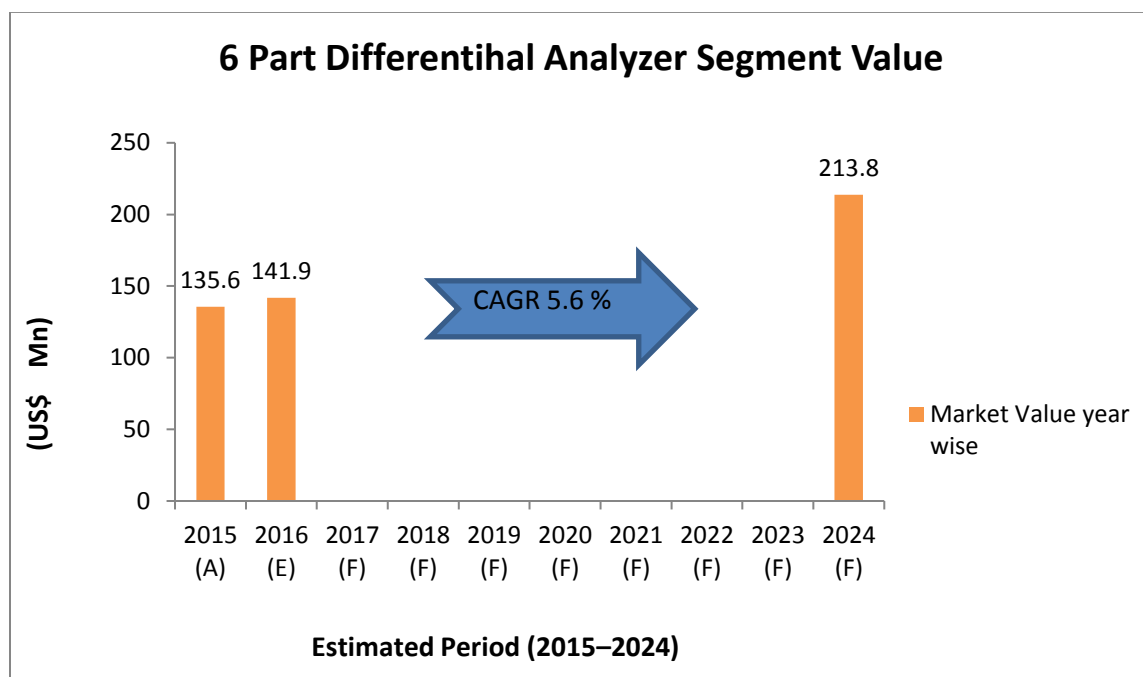
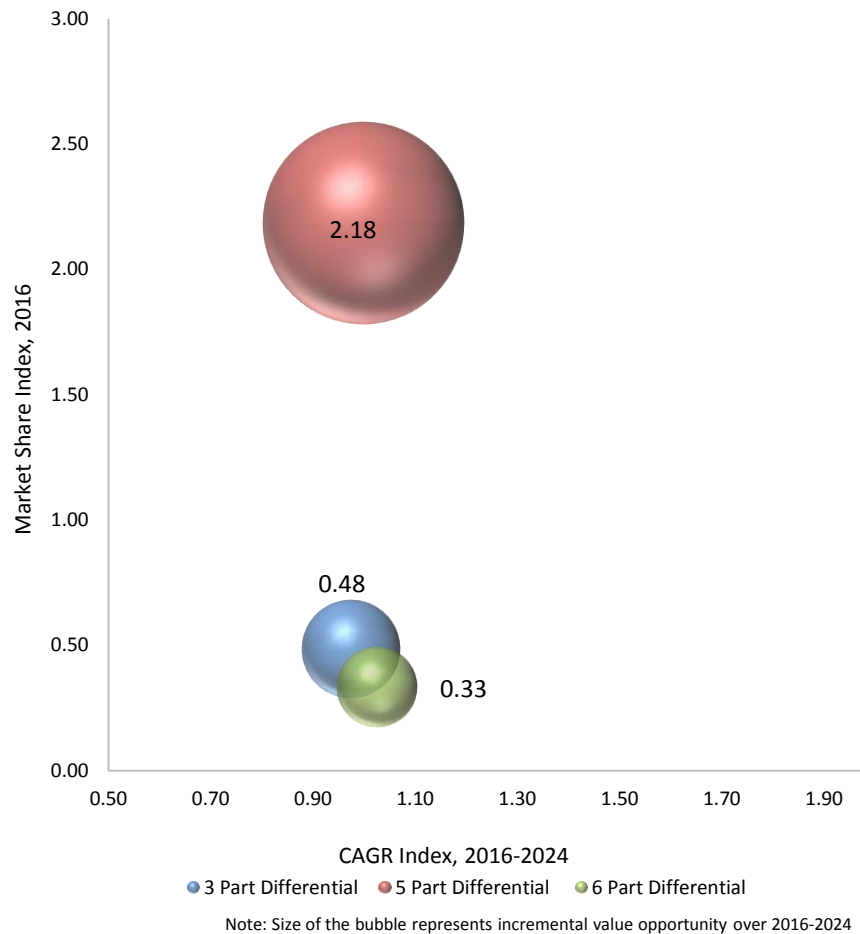


Figure 6: Estimated & forecasted 6 part differential analyzer segment value

6.6 Market attractiveness of global Hematology Analyzer product segment



- 5 Part Differential Analyzer segment dominated the global Hematology Analyzer market in revenue terms in 2015 and is projected to continue to do so throughout the forecast period. 5 Part Differential Analyzer segment is the most attractive segment, over the forecast period.

6.7 Estimated & forecasted global modality Segment Share, 2015–2024

- Standalone is expected to account for major revenue share of the global Hematology Analyzer market by 2016, as the Standalone Analyzers are mostly preferable in the large scale hospitals.
- Point of Care is expected to account for minor revenue share of the global Hematology Analyzer market due to owing presence of large number of small scale hospitals.

Estimated Global Modality Segment share, 2016

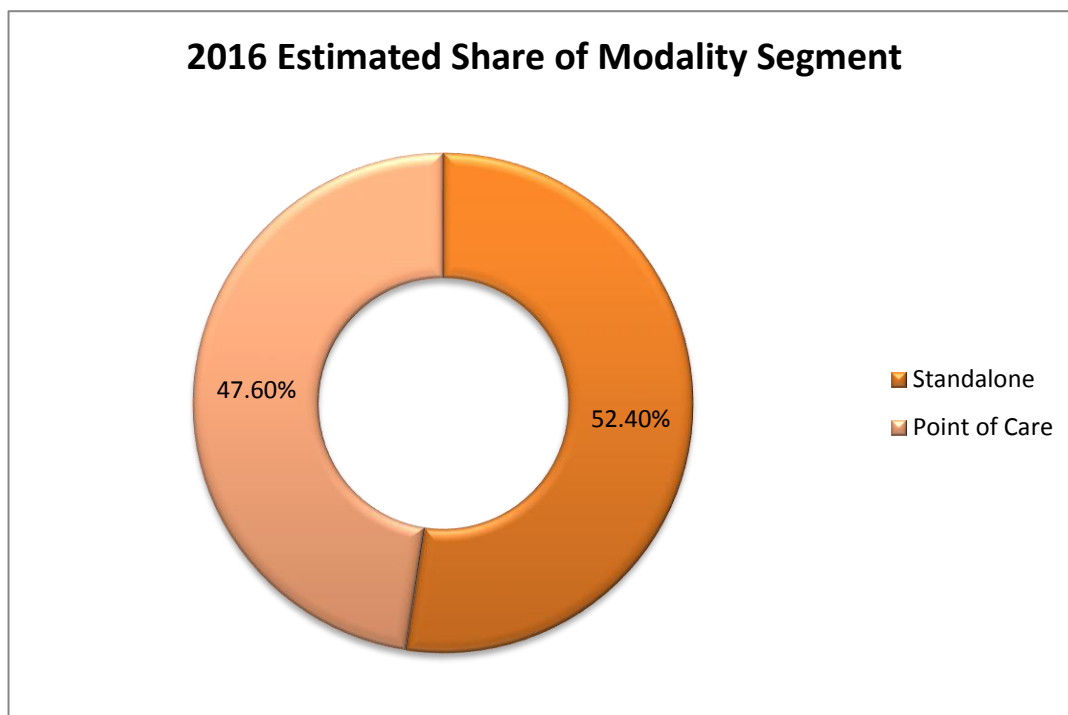


Figure 7: Estimated global hematology analyzer modality share

Forecasted Global Modality Segment share, 2024

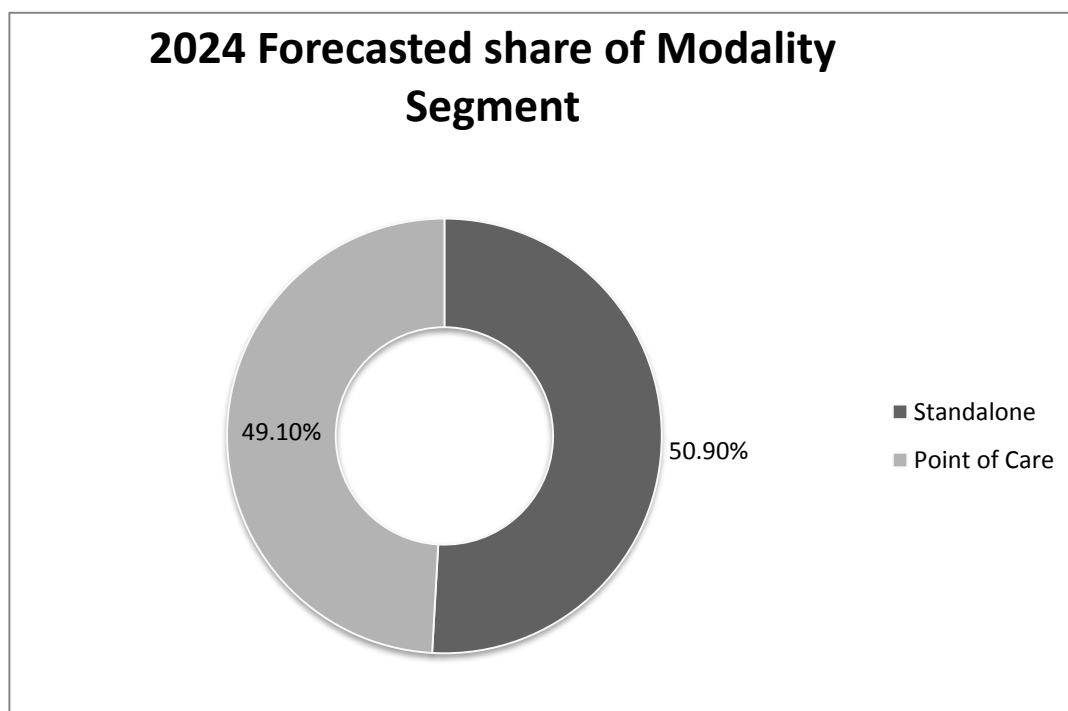


Figure 8 : Forecasted global hematology analyzer modality share

6.8 Estimated & forecasted global modality Segment Value (US\$ Mn), 2015–2024

- Standalone Analyzer is high Capital based instruments with multiple functions and more advantageous over the small capital based instruments. It is stable growing segment in developed countries.

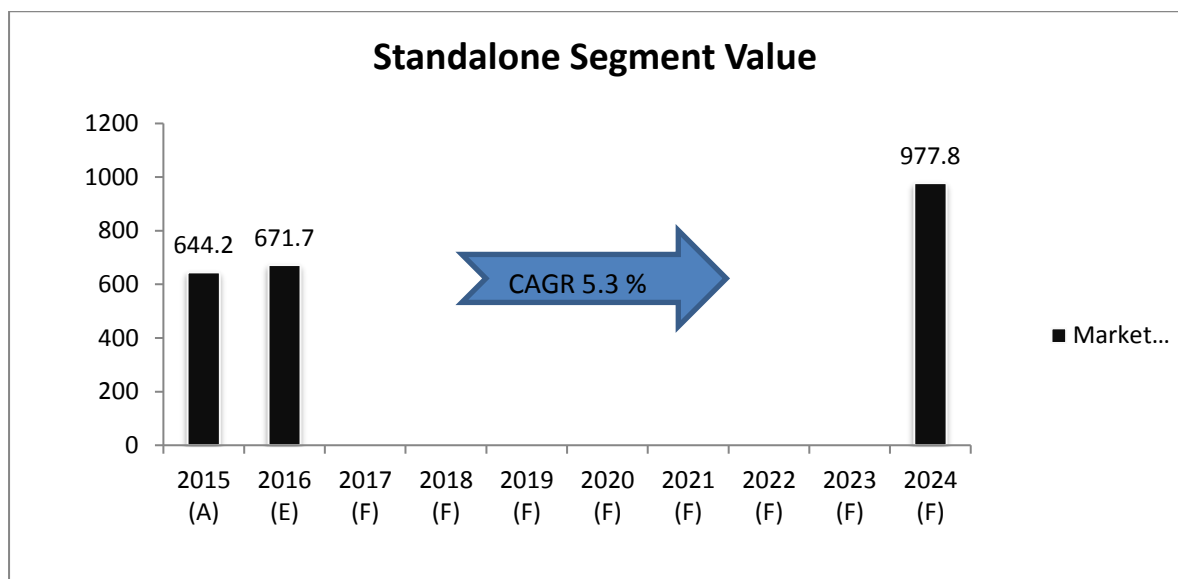


Figure 9: Estimated and forecasted Standalone analyzer segment value

6.9 Estimated & forecasted global modality Segment Value (US\$ Mn), 2015–2024

- Point of Care is best suited in small hospitals with less bench space and increases the flexibility of Diagnosis. It is fastest growing segment in the emerging countries.

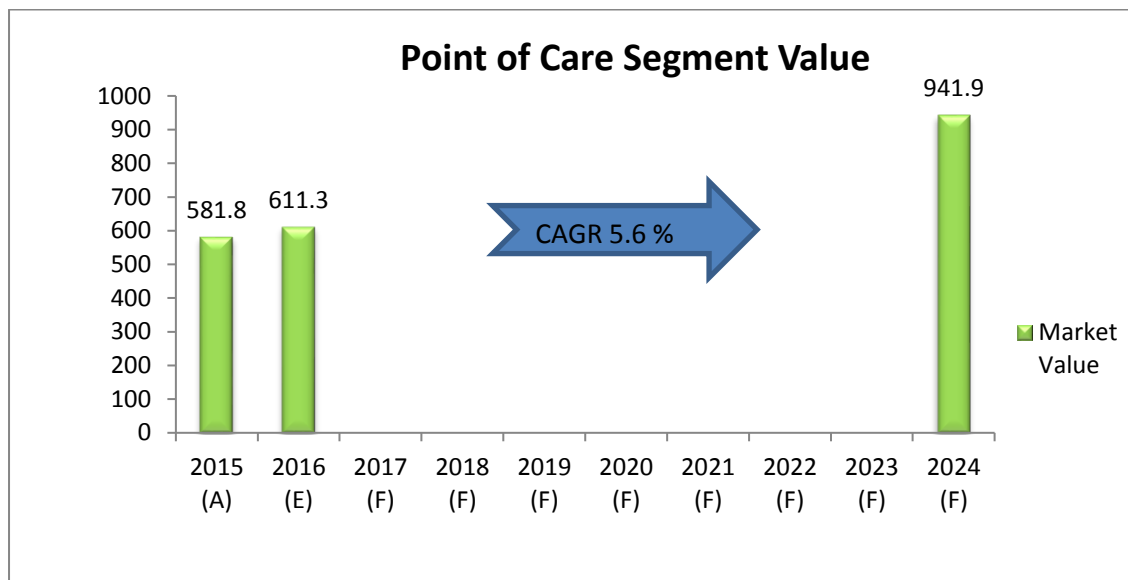
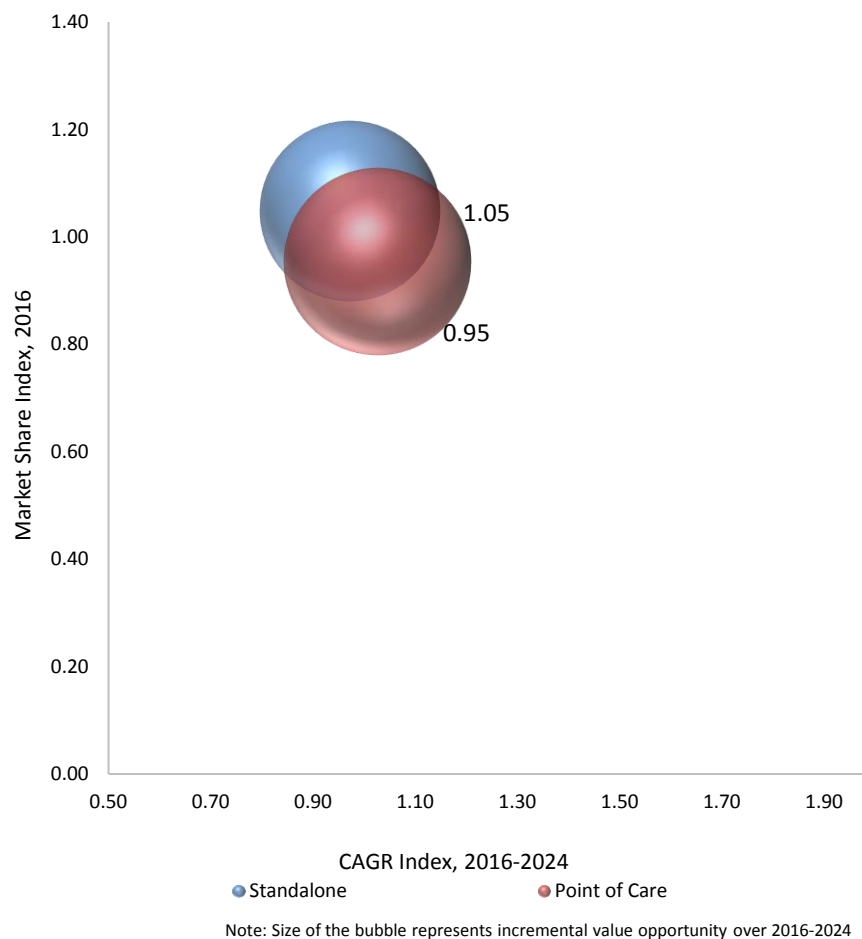


Figure 10: Estimated and forecasted Standalone analyzer segment value

6.10 Market attractiveness of Modality segment

- Standalone segment dominated the global Hematology Analyzer market in revenue terms in 2015 and is projected to continue to do so throughout the forecast period. Modality segment is the most attractive segment, with during the forecast period
- Point of Care segment is expected to be the second most lucrative segment in the global Hematology Analyzer market, over the forecast period



6.11 Estimated & forecasted global End User Segment Share, 2015–2024

- Hospitals segment is expected to lose its market share by 2024 over 2016, due to decreasing number of hospital visits for diagnosis purpose.
- Diagnostic Centers segment is expected to gain its market share by 2024 over 2016 due to large number of diagnostic centers worldwide and easy availability of the diagnosis through this segment.
- Ambulatory Surgical Centers segment is expected to gain its market share by 2024 over 2016, due to increasing patient compliances with this segment.
- Blood Banks segment is owing to high stable growth due to high regulatory control.

Estimated Global End User Segment share, 2016

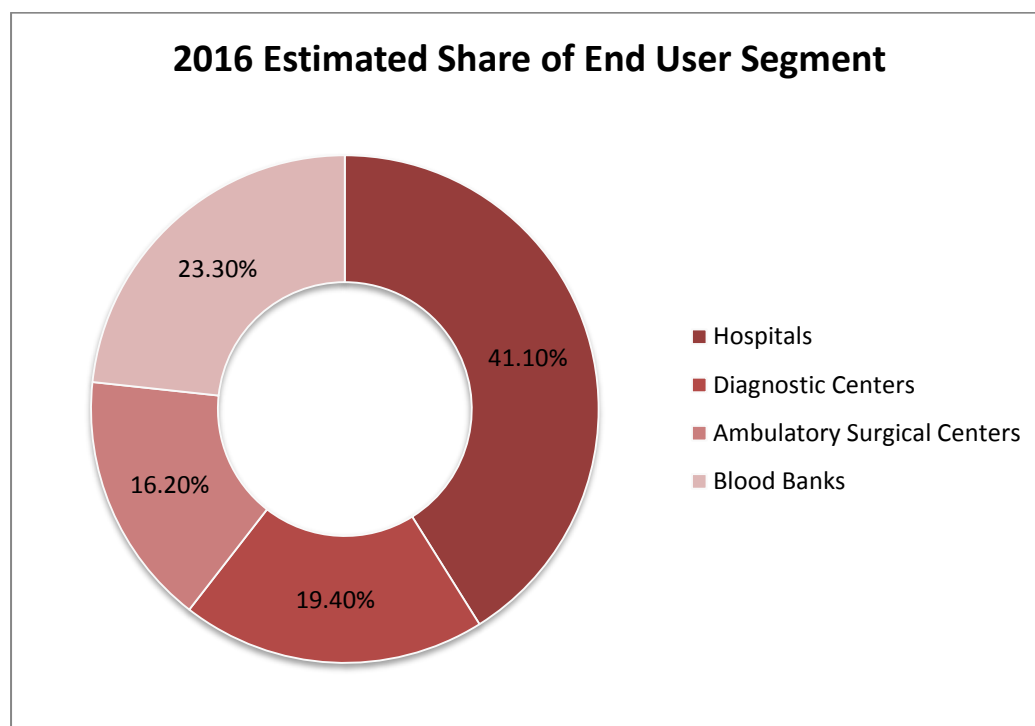


Figure 11: Estimated global hematology analyzer End User share

Forecasted Global End User Segment share, 2024

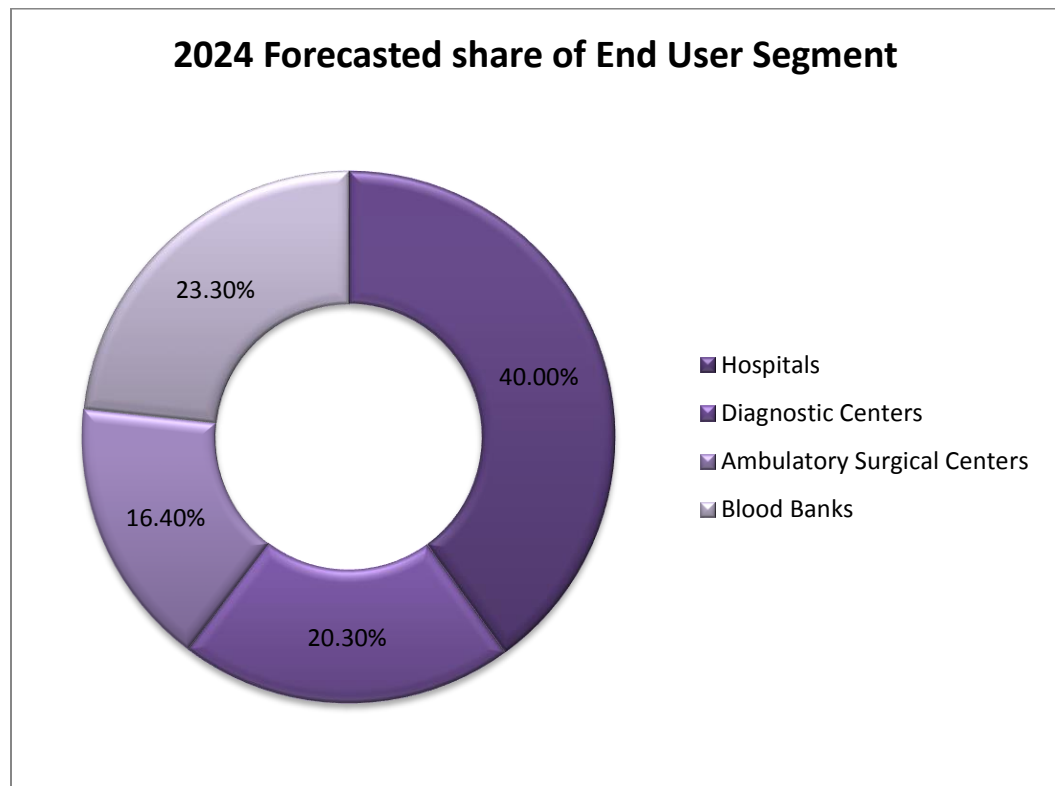


Figure 12: Forecasted global hematology analyzer End User share

6.12 Estimated & forecasted global Hospital Segment Share Value (US\$ Mn), 2015–2024

- It has been witnessed that the demand for Hematology Analyzers is remains constant in hospitals.

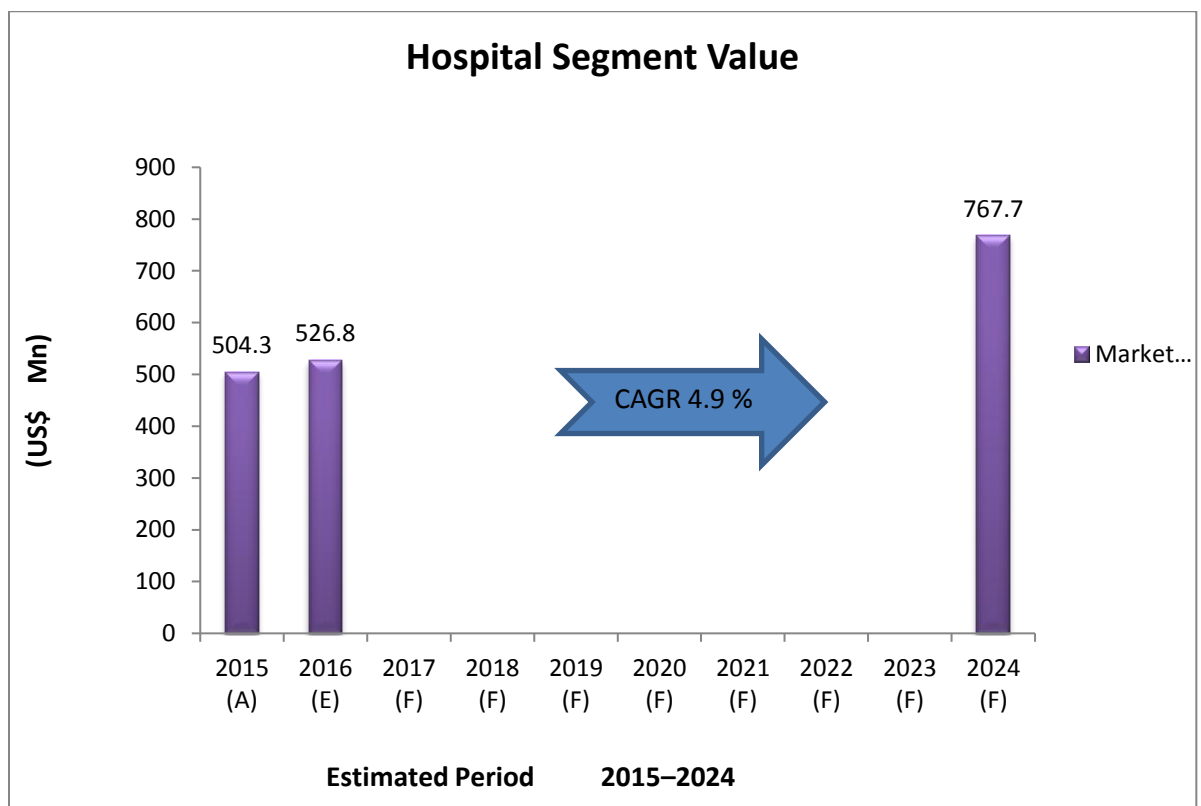


Figure 13: Estimated and forecasted Hospital segment value

6.13 Estimated & forecasted global Diagnostic Segment Share Value (US\$ Mn), 2015–2024

- Increasing convenience with diagnostic centers is expected to boost the growth of the End User segment over the forecast period.

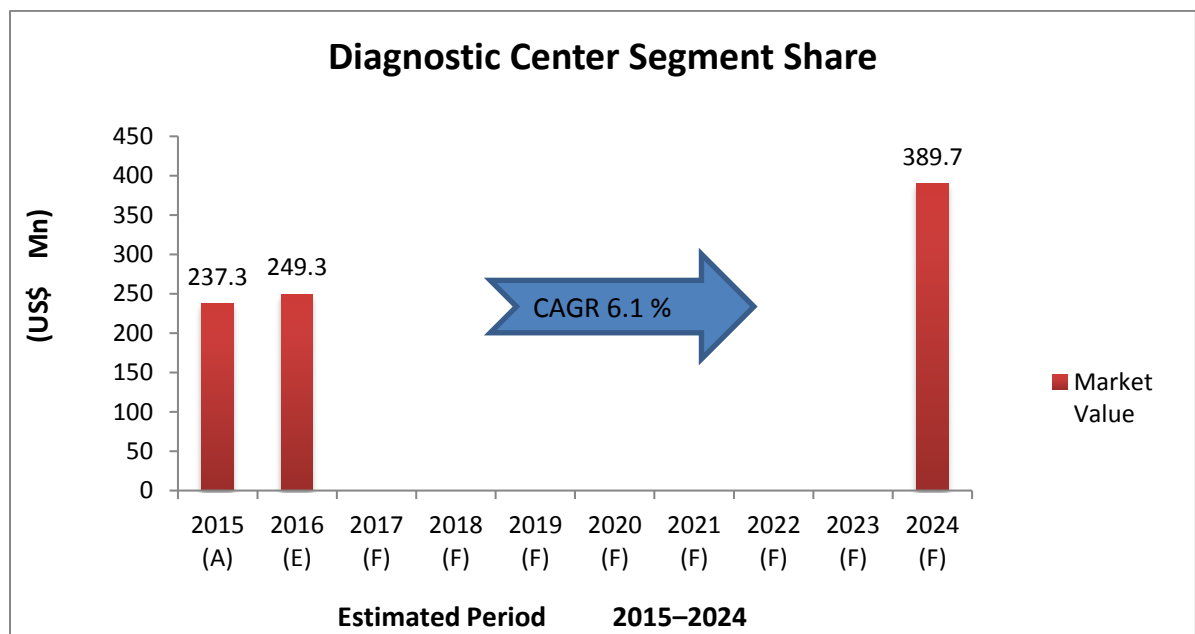


Figure 14: Estimated and forecasted Diagnostic segment value

6.14 Estimated & forecasted global Ambulatory Surgical Center Segment Share Value (US\$ Mn), 2015–2024

- Increasing cases in Ambulatory surgical centers for emergency purposes is expected to boost the growth of the Hematology Analyzer Market.

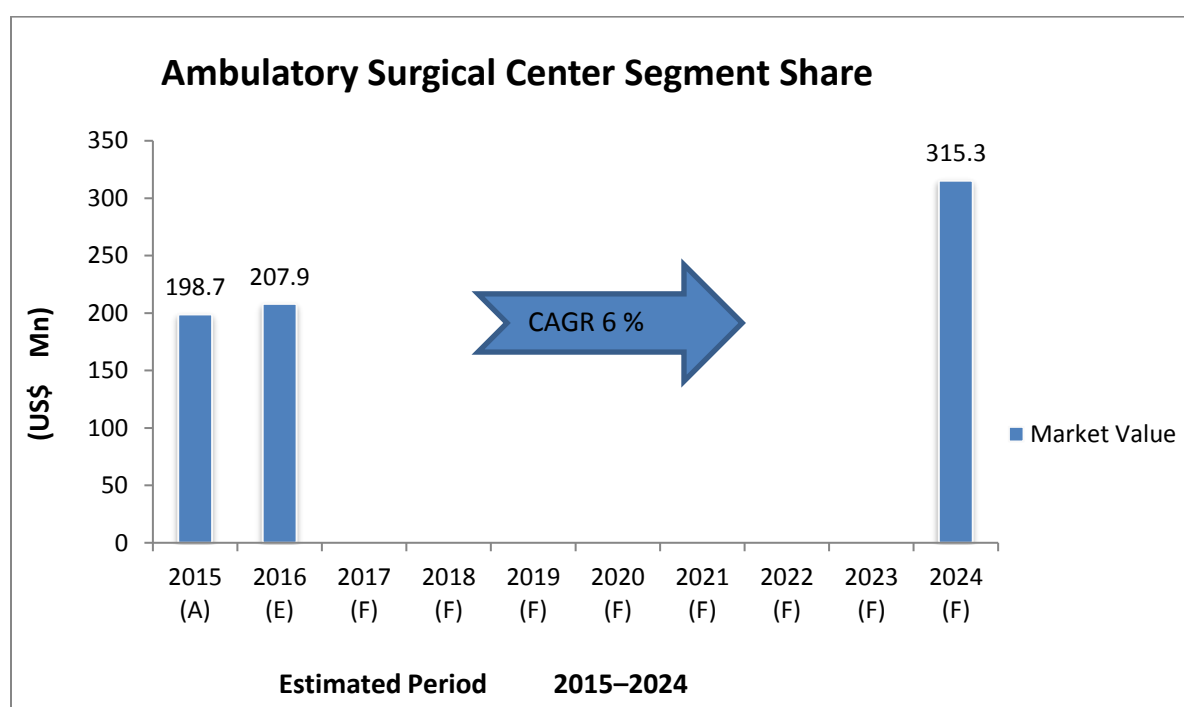


Figure 15: Estimated and forecasted Ambulatory Surgical Center segment value

6.15 Estimated & forecasted global Blood Bank Segment Share Value (US\$ Mn), 2015–2024

- Owing to increasing blood donations due to rising awareness in the developing countries is expected to boost demand for Hematology Analyzers in Blood Banks segment

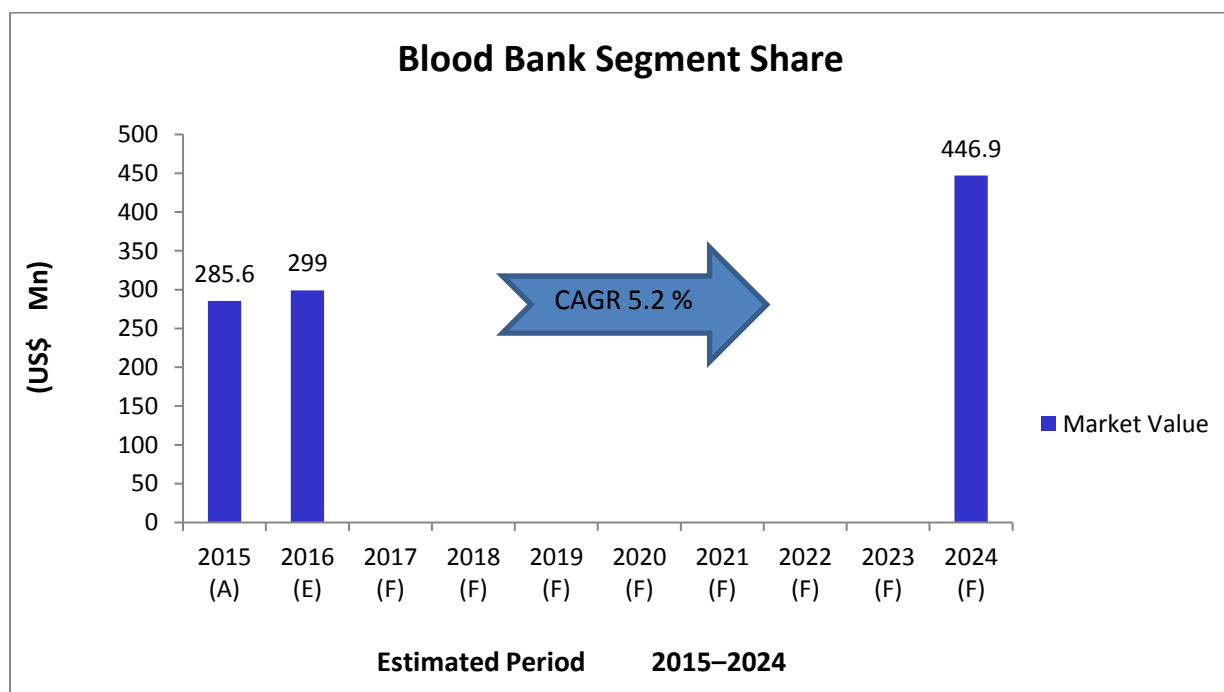
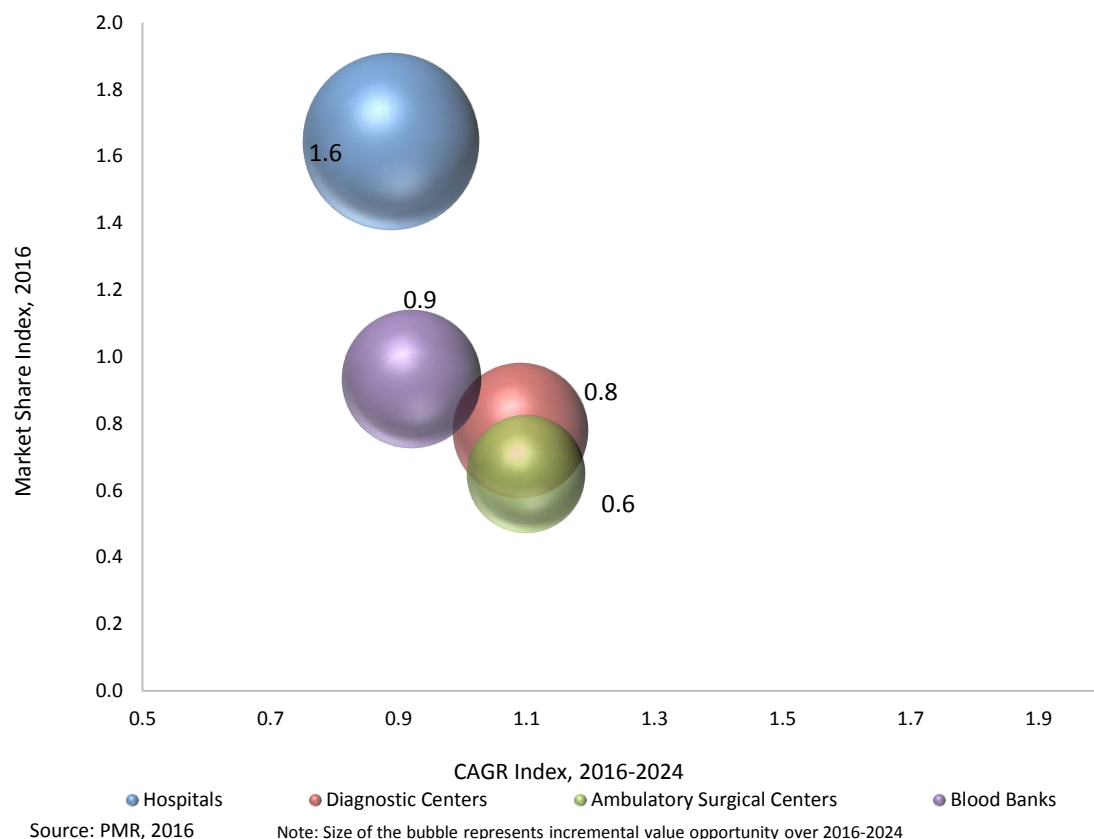


Figure 16: Estimated and forecasted Ambulatory surgical segment value

6.16 Market attractiveness of End User segment

- Hospital segment dominated the global Hematology Analyzer market in revenue terms in 2015 and is projected to continue to do so throughout the forecast period. This segment is the most attractive segment during the forecast period
- Blood bank segment accounted for second major value share in 2015 and is projected to remain same by 2024 end, during the forecast period
- Diagnostic center segment is expected to be the third most lucrative segment in the global Hematology Analyzer market, during the forecast period
- Ambulatory Surgical Centers segment is expected to be the almost same attractive segment like diagnostic center segment in the global Hematology Analyzer market, during the forecast period



6.17 Estimated & forecasted region wise Segment Share, 2015–2024

- North America regional market is expected to account for major revenue share of the global Hematology Analyzer market by 2016 end and owing to stable market and new technology advancements pool, which in turn is expected to boost demand for Hematology Analyzer over the forecast period.
- Europe Hematology Analyzer market is expected to account for second major revenue share of the global Hematology Analyzer market by 2016 end and owing to increasing adoption of new product line European countries.

Estimated Global Region Wise share, 2016

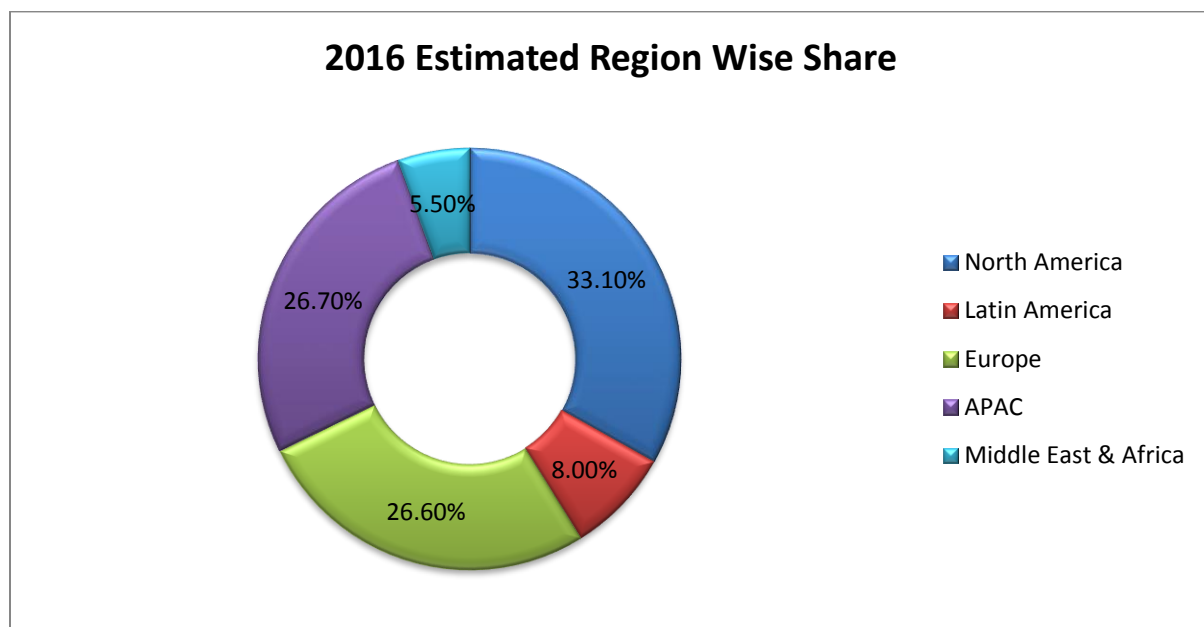


Figure 17: Estimated Region Wise value

Forecasted Global Region Wise share, 2024

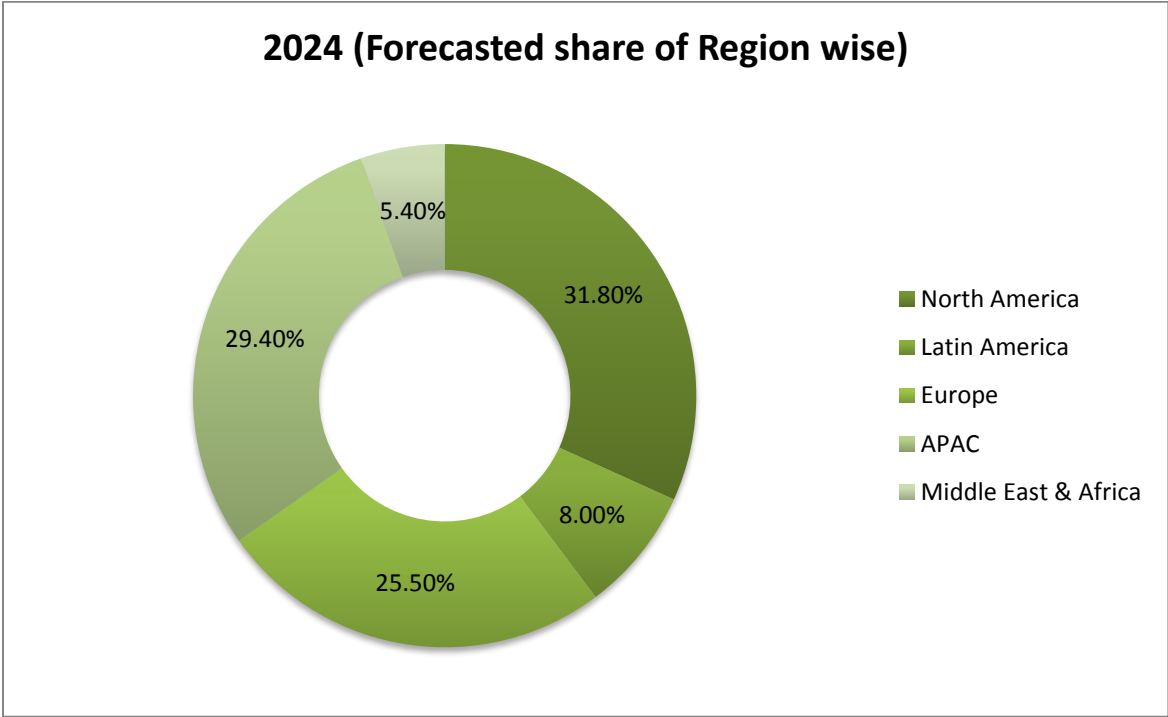


Figure 18: Forecasted Region Wise value

6.18 Estimated & forecasted North America Value Share, 2015–2024

- North America Hematology Analyzer market is flooded with variety of Hematology Analyzers for diagnostic purposes, moreover the high awareness of blood related issues in this region is expected to create high growth opportunities over the forecast period

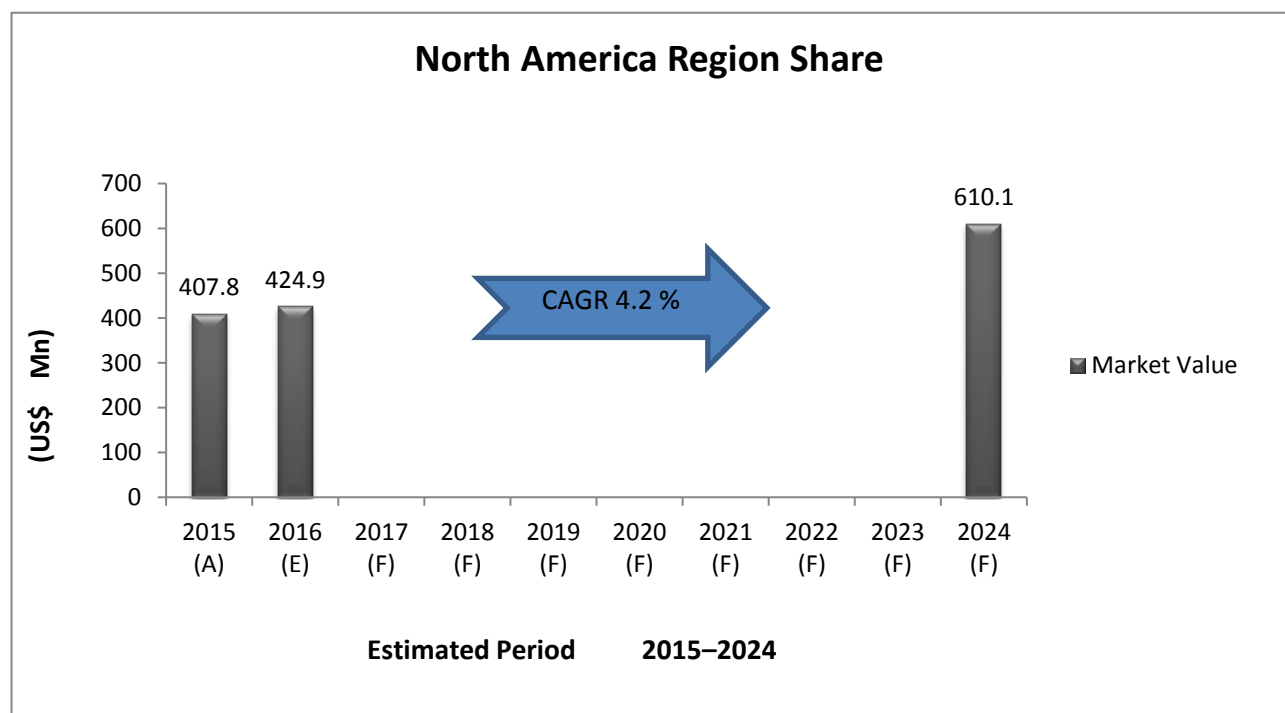


Figure 19: Estimated and forecasted North America Region value

6.19 Estimated & forecasted Latin America Value Share, 2015–2024

- Changing government policies and globalization of companies boosting the growth of Hematology Analyzers market over the forecasted period.

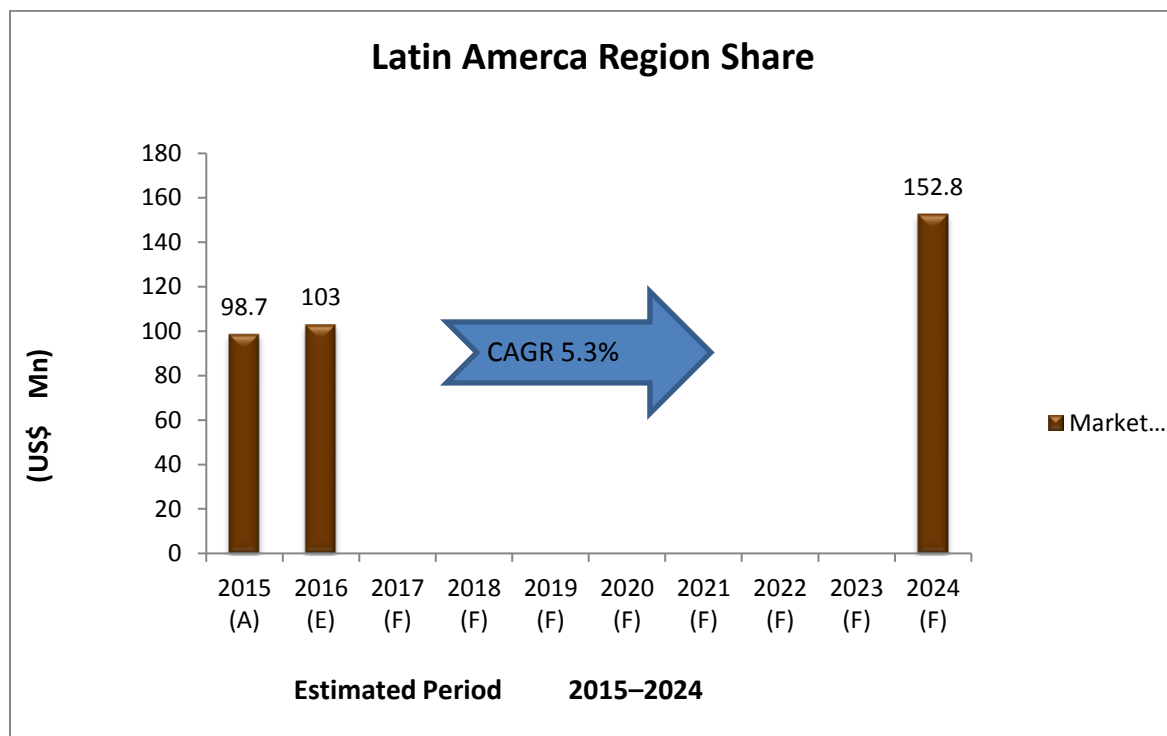


Figure 20: Estimated and forecasted Latin America value

6.20 Estimated & forecasted European Region Value Share, 2015–2024

- The increasing research activities for development of hematology Analyzers is gaining traction in Europe, which in turn is expected to give opportunity for this market over the forecast period.

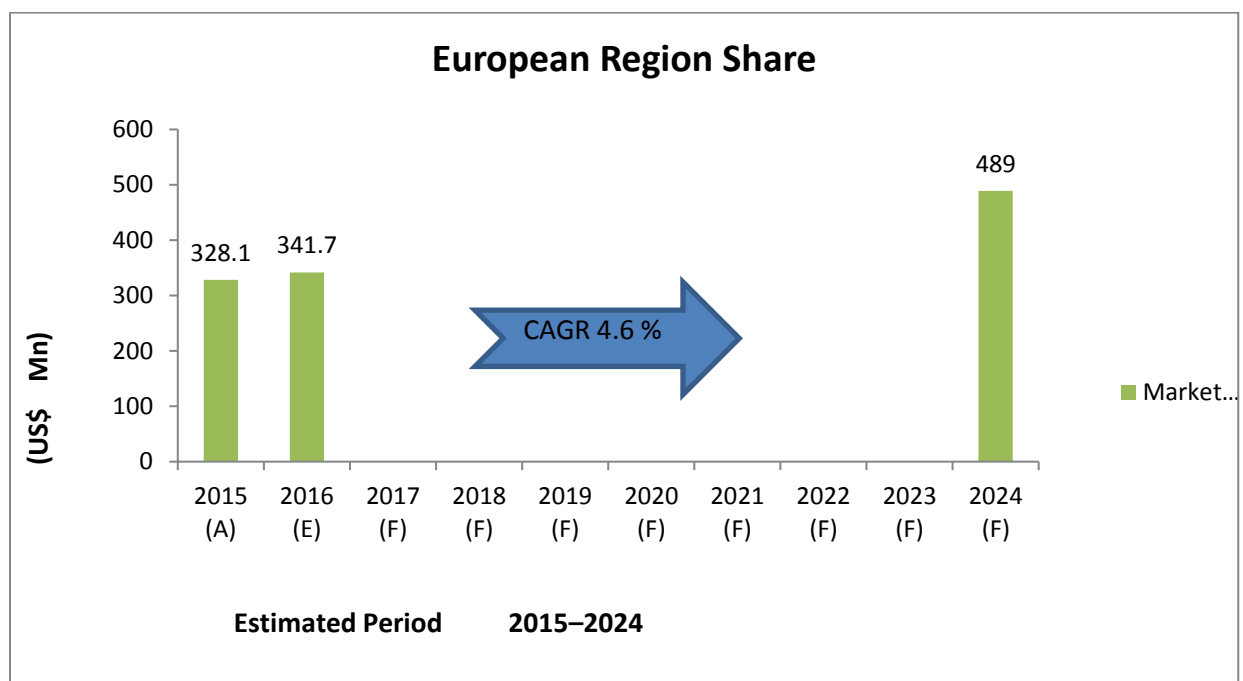


Figure 21: Estimated and forecasted European Region value

6.21 Estimated & forecasted APAC Region Value Share, 2015–2024

- High penetration and emerging economies of APAC region is expected to boost demand for Hematology Analyzer market over the forecast period.

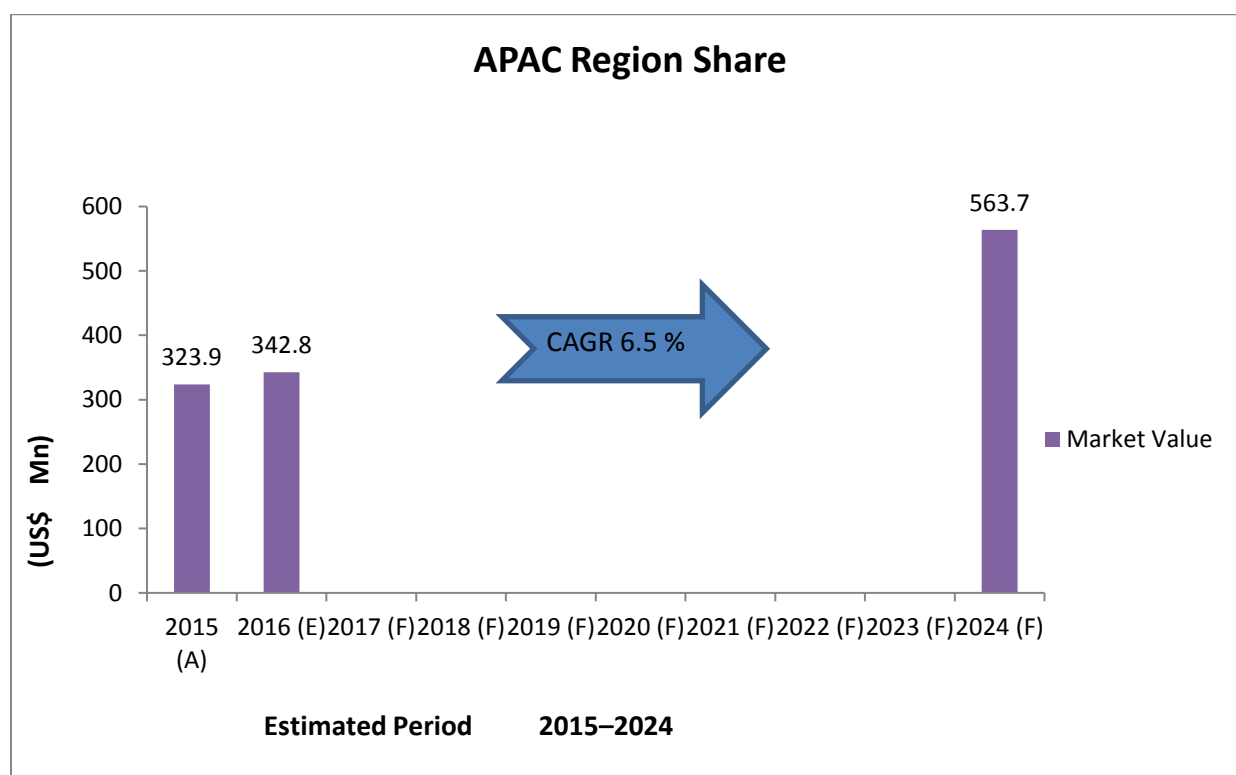


Figure 22: Estimated and forecasted APAC Region value

6.22 Estimated & forecasted MEA Region Value Share, 2015–2024

- Poor health system and changing policies is expected to hamper revenue growth however gradually increasing awareness in GCC countries is expected to grow over the forecast period.

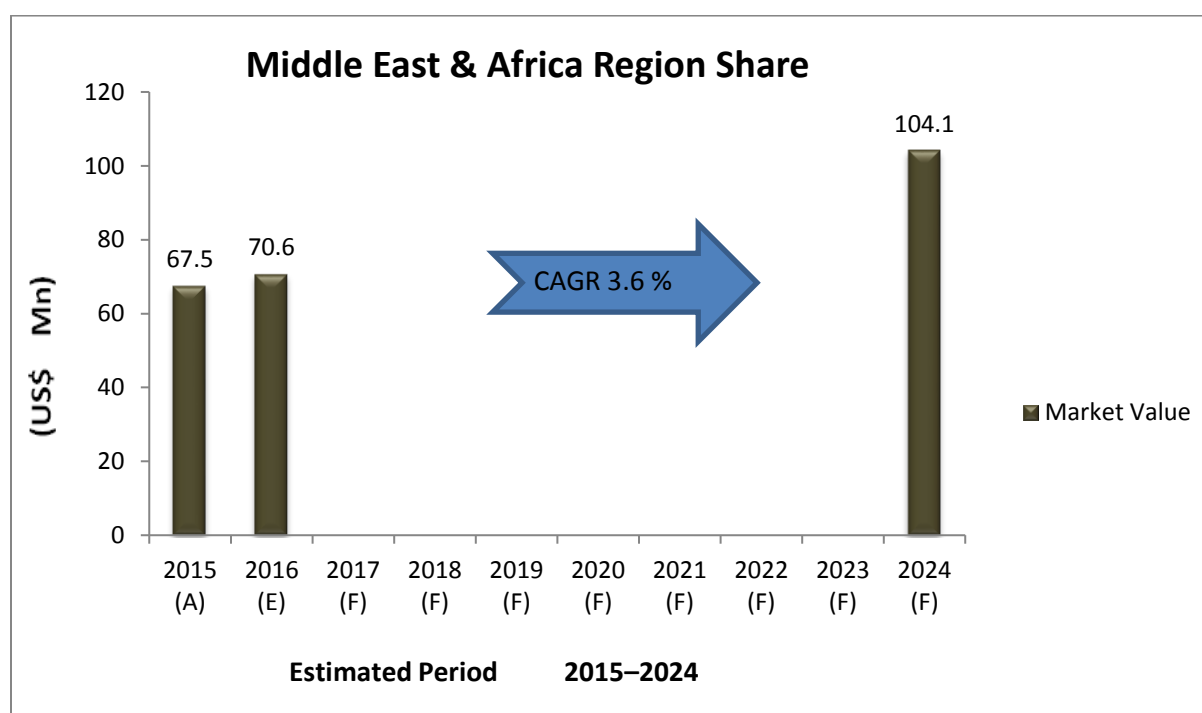
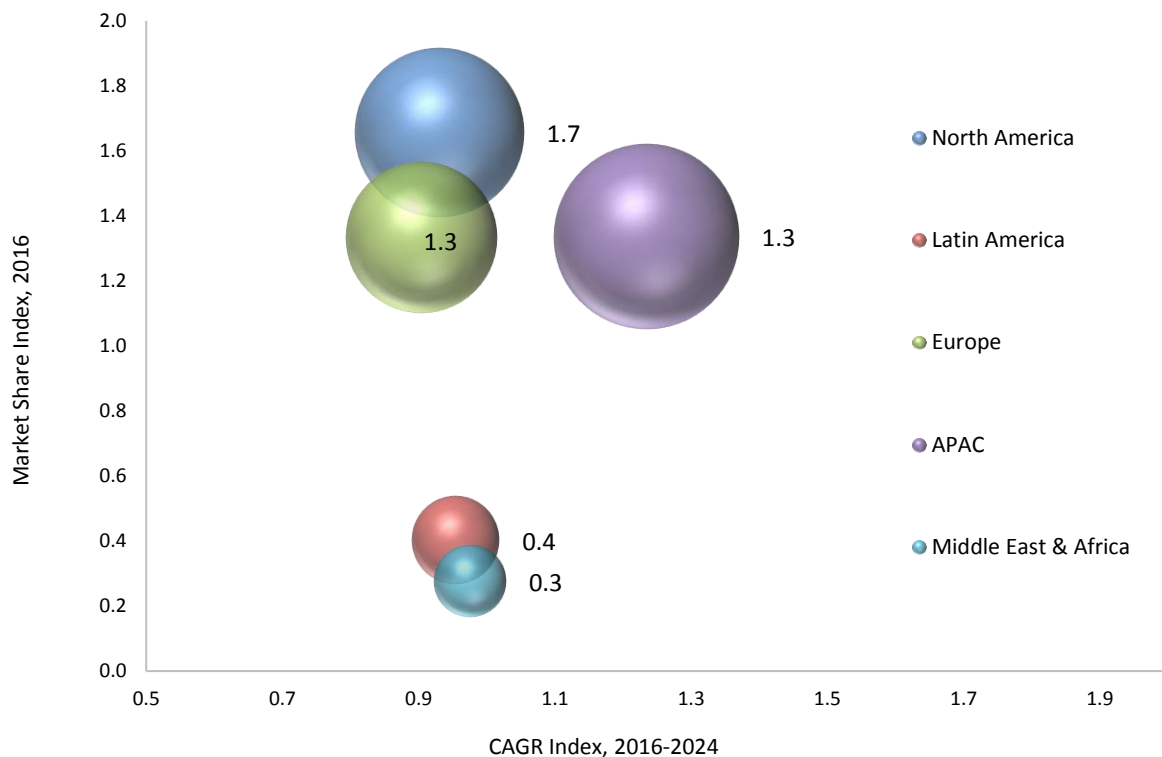


Figure 23: Estimated and forecasted MEA Region value

6.23 Market Attractiveness of Region

- North America Hematology Analyzer market dominated the global Hematology Analyzer market in revenue terms in 2015 and is projected to continue to do so throughout the forecast period.
- Europe Hematology Analyzer market is expected to be the second most lucrative in the global Hematology Analyzer market, during the forecast period.
- APAC Hematology Analyzer market is expected to be the third most lucrative in the global Hematology Analyzer market, during the forecast period.
- Latin America Hematology Analyzer market is expected to be the least attractive segment in the global Hematology Analyzer market over the forecast period.
- MEA Hematology Analyzer market is expected to be the least attractive segment in the global Hematology Analyzer market, over the forecast period.



Source: PMR, 2016

Note: Size of the bubble represents incremental value opportunity over 2016-2024

7. Qualitative Analysis

A. Drivers:-

1. Increase in the quality and efficiency of healthcare

- Hematology Analyzer are irreplaceable diagnostic tool for prevention, and monitoring of diseases related blood which is directly related quality of life of individual with a health issue.
- Technological advancements in hematology Analyzers significantly helping in developing unique selling proposition.
- Government encouraging companies by providing tax benefits and incentives. They are supporting the manufacturers indirectly in establishing new markets.
- The focus of healthcare is shifting towards Point-of-care Diagnostics. It is burgeoning the growth of the market.

2. Changing government policies

- The growing demand for more efficient testing to hold down healthcare costs and increasing availability of health insurance and medical insurance reimbursement due to government initiatives decreasing the cost pressures associated with diagnostic testing.
- Government initiatives like effective healthcare interventions, particularly health related promotion and disease prevention programmers that mainly target causes of morbidity and mortality.

3. Product Innovation

- Major market players in the global Hematology Analyzer Market are introducing innovative products to retain market share
 - ❖ Recent advances like artificial Intelligence System including Automatic Startup and Shutdown, 6 part differential type and simultaneous blood cell and C - reactive protein (CRP) (analyzer, which is produced by body in response to internal inflammation).
 - ❖ Silent design concept and touch screen are designed to meet today's laboratory requirement.
 - ❖ Companies are participating in lucrative marketing (one such example is medical expo's)

4. Technology Development

- Technological development is one of the most important drivers for value creation which drive towards robust growth.
- Advances in information technology have generated demand in the healthcare industry for IT-driven medical information networks. Such networks contribute to effective diagnoses by collecting and analyzing test data and consolidating this information into a convenient database for future purpose.

B. Restraints:-

1. Macro-Economic and Geopolitical Uncertainties

- Challenges due to geopolitical uncertainties and macro-economics, including global uncertainties related to monetary and fiscal policies are affecting global players.
- Monetary policy influencing the money supply by changing the interest rate. Fiscal policy influence demand in the economy by government tax rate and spending levels.
- The policy uncertainties affecting the global players and small businesses getting advantage by tax benefits. Government provides assistance in a variety of ways, including support on starting and managing business, providing loan guarantees and assistance in bidding on government contracts.
- This policy uncertainties is becoming a hurdle for global penetration of Hematology Analyzer market. It acts as a restraint in the growth of Hematology Analyzer Market.

2. Liquidity Risk

- Short term financial demands cannot fulfilled when a company facing Liquidity risk. It is less potential of product to get sold quickly enough to minimize a loss of company.
- The level of liquidity risk within an organization influences Investors, managers and creditors. It effects the company financial management.
- If liquidity risk is high, it effects the organization and effects the performance of company. Organization has to balance the liquidity by selling assets, bring in additional revenue in case of business has too much liquidity risk.
- Liquidity risk acts as a restraints in the growth of Small scale Hematology Analyzer Manufacturers.
- Liquidity risk is mostly seen in companies operating in the emerging countries.

3. Changing Regulatory Environment

- As a result of increasing concern about healthcare expenditures, Hematology Diagnostic tests have been under constant pressure over the last decade.
- Furthermore, the Hematology diagnostic industry is facing regulatory hurdles for Analyzer approval. In the European region, Hematology diagnostic registration only required the CE label (It is Approval label in European region) due to economic crisis.
- Health authorities of European region are increasingly pressure for additional proof that diagnostic tests not only have reasonable pricing when compared to the past, but also add ample value to population which increasing burdens on the companies and acts as a restraints in the growth of the market.

4. Excess and Obsolete Inventories

- Obsolete inventory refers to products become outdated and sales and usage of that product is decreased for a set period of time. It is mainly due to the inventory that is at the end of its product life cycle and.
- This type of products causes a huge burden to companies because conversion of products is less and cause a financial loss.
- One Example is Semi-Automatic Hematology Analyzer. Due Automation of Hematology Analyzer, the Semi-Automatic Hematology Analyzers becoming slowly obsolete.
- It creating a fear in Hematology Analyzer Manufacturers due to future uncertainties.
- Excess and Obsolete act as a in the growth of the Hematology Analyzer Market.

C. Opportunities:-

1. New product innovation

- Companies gain their competitive advantage and economic benefits largely from innovation.
 - ❖ Innovation gives rise to advantage over alternatives and helps in acquiring new markets, generates growth for company, and creates customer value proposition. Innovation contributing to higher productivity, lower costs, increased profits and employment and improves existing products and processes. Firms that innovate have higher global market share when compared to the competitors, higher penetration rates and higher profitability. This additional benefits of innovative product attracts more customers.
 - ❖ Example, Horiba medical launches a product with Artificial Intelligence System including Automatic Startup and Shutdown, 6 part differential type. It simultaneous counts blood cell and C - reactive protein (CRP) (analyzer, which is produced by body in response to internal inflammation).
 - ❖ Silent Design: - Sysmex XN-Series hematology analyzers help doctors detect cancer cells and quickly determine treatment options for children with leukemia.

4. Geographic diversity

- Geographic diversity provides greater stability to operations, allows to draw on the skills of a global workforce. It allows in developing global economic trends that are specific to particular economies and drive towards economies of scale. It gives an opportunity to access new market for Hematological Analyzer products.
- It reduces dependence on the single market. If a business is effected by demand fluctuations in one segment, hematology Analyzer companies can balance the revenue

from other segment in other market. Thus geographical diversity also plays important roles in controlling liquidity risk.

- By globalization, not only companies but also End User get an opportunity of wide range of product portfolio which finally increases the sales of Hematology Analyzer Market.

D. Trends:-

1. Focus on Innovation

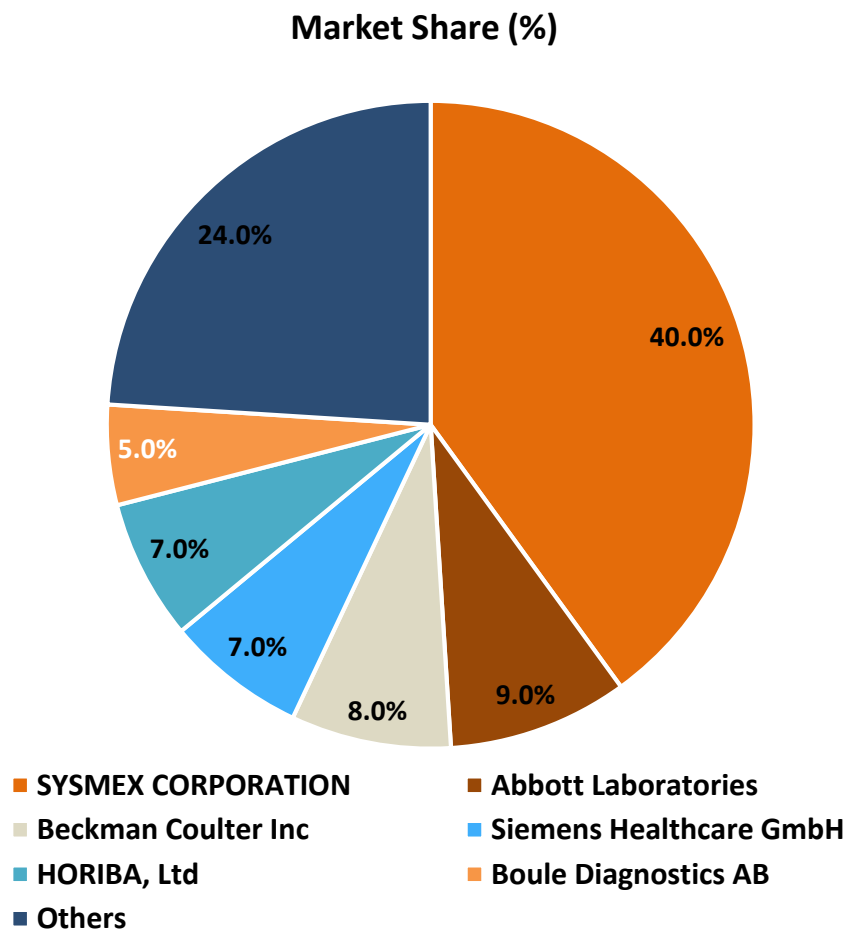
- Automated Hematology Analyzer have undergone a fierce technological evolution owing to the introduction of new techniques for cellular analysis and the burgeoning evolution of software. It showed an improvement in analytic efficiency and data management.
- Today's hematology analyzers are able to provide much more information, both quantitative, because of extended parameters and qualitative i.e. suspect flags (used to detect errors). Real-time graphical data provide an information regarding abnormal cell population and disease patterns.
- These processes help in reducing manual reviews, thereby improving the efficiency.

2. Automation

- Automation increases the opportunities of hematology analyzers by incorporating automated ESR (erythrocyte sedimentation rate) systems, , integral Slidemaker, HbA1c(form of hemoglobin used to test Diabetes) system, tube sorters, digital morphology system, linked to the middleware.

- ❖ Increased clinical utility with SF technology introduced by Mindray and other product like BC 6800 is used to virtually see a clearer picture of blood. It is equipped with additional flagging like RBC agglutination, blasts, lipid interference, malaria,, ALY, fragments, cold agglutinins.
- ❖ Some hematology analyzers are equipped with a body fluid mode for reporting total nucleated cell count, WBC differential and red cell count.

8. Competitive Dashboard



- Global Hematology Analyzer market is highly fragmented owing to presence of various companies especially global manufacturers.
- SYSMEX CORPORATION is the leader in the global Hematology Analyzer market in terms of revenue share in 2015. SYSMEX CORPORATION offers a wide product portfolio and operates in all three Product type segments i.e. 3 Part Differential, 5 Part Differential, 6 Part Differential Analyzers.
- Abbott Laboratories holds second position in the global Hematology Analyzer market. As the market is fragmented with brisk competition amongst various players, Abbott Laboratories accounted for 9% share in terms of global market revenue in 2015.
- Others account for 24% share of the global market revenue, depicting the competition level amongst the various players. Major companies considered in others are Beckman Coulter Inc, Siemens Healthcare GmbH, HORIBA, Ltd., Boule Diagnostics AB.

Company	Product Offerings			Strategy
	3 Part Differential	5 Part Differential	6 Part Differential	
Company Dashboard				
SYSMEX CORPORATION	Y	Y	Y	The company focuses on developing new products through in-house R&D activities, acquisitions and collaborations.
Abbott Laboratories	Y	Y	N	The company is mainly focusing on balance between various elements of business to maintain optimal mix across the multiple dimensions of competitive landscape.
Beckman Coulter Inc	Y	Y	N	The company focuses on developing new products with the collaboration of the parent company (Danaher).

Siemens Healthcare GmbH	Y	Y	N	The company focuses on strategic partnerships to expand innovation map beyond established portfolio, and investing in new segment which will help to develop new business fields.
HORIBA, Ltd	Y	Y	Y	Accelerating investments in basic analytical and measurement technology development.
Boule Diagnostics AB	Y	Y	N	The company is mainly focusing on global sales via parallel distribution channels to quickly meet local demand of the customers.
Mindray	Y	Y	N	The company channeled huge investments (10% of annual revenues) into R&D
NIHON KOHDEN CORPORATION	Y	Y	N	The company focuses on strengthening technological development capabilities, business expansion by region and further growth in core business.
Diatron	Y	Y	N	The company focus on new distributor partners in number of selected international markets to expand the globally.
Cellavision	N	Y	N	The company is mainly focusing on indirect business model, selling via well-established partners. The model continually delivers increased market penetration and higher growth.

Product Offering (Y – Yes N – No)

1. **SYSMEX CORPORATION**

- Sysmex corporation development, manufacture, sales and export/import of diagnostic instruments, reagents and related software.

- The company currently operates in more than 190 countries.
- It entered an alliance with current F. Hoff man-La Roche Ltd. in hematology products.

Product & Services Offerings

- **XN-1000**
- **XN-2000**
- **XN-3000**
- **XN-9000**
- **XS-1000I**

Strategy Overview

- The company focuses on developing new products through in-house R&D activities, acquisitions and collaborations.
 - In September 2015, Sysmex Corporation plans to establish a new open innovation lab for increasing the research and development (R&D) activities toward the realization of personalized medicine.
 - In April 2015, Sysmex and Siemens Healthcare Laboratory Diagnostics extended their long-standing partnership by 2020.
 - In September 2013, the company acquired Indivumed GmbH to expand its clinical research service and patient diagnostics business.

Abbott Laboratories

Company Description

- Abbott Laboratories (Abbott) is one of the leading organizations engaged in the production of pharmaceuticals, nutritional products, diagnostics, and medical devices
- In diagnostics, it mainly deals with medical diagnostic instruments, tests, automation and informatics solutions for hospitals, reference labs, blood centers, emergency departments, physician offices and clinics.
- Abbott has sales in more than 150 countries, serving every region of the world.

Product Portfolio

- **Ruby**
- **SMS**
- **Sapphire**
- **Emerald**

Strategy Overview

- The company is mainly focusing on balance between various elements of business to maintain optimal mix across the multiple dimensions of competitive landscape.
- It undertook organic growth strategy such as expanding its product portfolio with new introductions in order to reach more customers.

Beckman Coulter Inc

Company Description

- Beckman Coulter Inc (Beckman) designs, manufactures and markets biomedical laboratory instruments, software and supplies.
- Its products are used in a range of applications, including medical research, clinical trials and drug discovery, and diagnostic laboratories in hospitals.
- Beckman operates its functions in more than 130 countries.

Product Portfolio

- **DxH**
- **UniCel DxH**
- **COULTER Ac-T 5**
- **COULTER LH**

Strategy Overview

- The company focuses on developing new products with the collaboration of the parent company (Danaher).
- Beckman is mainly focusing on technology which provides labs with new possibilities in diagnostics, greater efficiencies in workflow, enhanced resource utilization and higher accuracy (Example: Automated Intelligent Morphology (AIM) smart 3D technology).

Siemens Healthcare GmbH

Company Description

- Siemens is a global producers of energy-efficient, resource-saving technologies, Siemens is a supplier of systems for power generation and transmission as well as medical diagnosis.
- It provide infrastructure solutions as well as automation, drive and software solutions for industry.
- The company is active in more than 200 countries, focusing on the areas of electrification, automation and digitalization.

Product Portfolio

- **Advia 120**
- **Advia 2120**
- **Advia 2120i**
- **Advia 360**
- **Advia 560/560AL**

Strategy Overview

- The company focuses on strategic partnerships to expand innovation map beyond established portfolio, and investing in new segment which will help to develop new business fields.
- Siemens invests a significant part of its total revenue on R&D activities principally to maintain its development methodologies at the highest level in the market.
- It acquire technological components in support of the company's differentiation strategy and the development of reusable product lines.

HORIBA, Ltd.

Company Description

- The Company manufactures and sells automotive emission measurement systems, environmental measuring instruments, wide range of scientific analyzers, and medical diagnostic analyzers, and measuring equipment used in the semi-conductor industry.
- HORIBA also manufactures and markets peripheral measuring and analysis devices. Moreover, the Company equips such facilities as laboratories with measuring and analytical equipment for R&D, production, and other applications.

Product Portfolio

- **Pentra nexus**

- **ABX Pentra 80**
- **ABX Pentra 60**
- **ABX Micros**

Strategy Overview

- Accelerating investments in basic analytical and measurement technology development.
- Accelerating corporate growth by its balanced management, matrix organization, and HORIBA Stained Glass Project.
 - Raising capital efficiency to maximize corporate value.

Boule Diagnostics AB

Company Description

- Boule's offering is aimed at customers in the global market for decentralized and near-patient blood diagnostics for the human and veterinary segment.
- The market for decentralized blood diagnostics accounts for more than one fourth of the global market in this segment and mainly comprises small to medium-sized hospitals, clinics and hospitals.

Product Portfolio

- **Swelab**
- **Medonic**
- **Quintus**

Strategy Overview

- The company is mainly focusing on global sales via parallel distribution channels to quickly meet local demand of the customers.
- Company t instruments to proprietary consumable products to ensure quality and added sales of the hematology analyzers.
- It also participating in active acquisitions and cooperation strategies to broaden product offer.

Mindray

Company Description

- Mindray is global providers of medical devices and solutions mainly in the fields of Patient Monitoring & Life Support, In-Vitro Diagnostics, and Medical Imaging System.
- The company has 42 subsidiaries and branch offices in 33 countries in North and Latin America, Europe, Africa and Asia-Pacific, as well as 32 branch offices in China.

Product Portfolio

- **CAL 8000**
- **BC Series**
- **SC Series**

Strategy Overview

- The company channeled huge investments (10% of annual revenues) into R&D.
- It mainly focuses on innovation, which drives rapid development of leading-edge medical solutions.
- The company is mainly focusing on M&A to create a solid network around the globe.

NIHON KOHDEN CORPORATION

Company Description

- Nihon Kohden provides a wide range of medical electronic equipment including EEG, EMG/EP measuring systems, electrocardiographs, bedside monitors, defibrillators and hematology analyzers.
- Nihon Kohden products are used in more than 120 countries. The Company now has the sales subsidiaries in the US, Mexico, Colombia, Brazil, Germany, France, Spain, Italy, the UK, China, Singapore, Thailand, Malaysia, India, UAE, and Korea.

Product Portfolio

- **Celltac G**
- **Celltac F**
- **Celltac Es**
- **Celltac *a***

Strategy Overview

- The company focuses on strengthening technological development capabilities, business expansion by region and further growth in core business.
- In 2014 The Company established a sales subsidiary Malaysia to expand its sales across the Asia-Pacific region, during the year; Nihon established a research and development subsidiary, Nihon Kohden Innovation Center, in Boston.

Diatron

Company Description

- Diatron develops, manufactures and markets hematology analyzers, clinical chemistry analyzers, and associated reagents for human medical and veterinary use.
- Company's products being sold and marketed in more than 110 countries.
- The revenue of the parent company in 2015 is 158.63 Million USD and Diatron Group generated sales equivalent to around 34 million USD in the 2015 financial year.

Product Portfolio

- **Abacus 5**
- **Abacus 380**
- **Abacus 3CT**
- **Abacus Junior 30**

Strategy Overview

- The company focus on new distributor partners in number of selected international markets to expand the globally.
- It mainly participates in global trade shows, to introduce new hematology instruments.

Cellavision

Company Description

- CellaVision's product portfolio consists of analyzers with supporting applications and software, which replace conventional microscopy.
- It focuses on the development and commercialization of systems for analysis of blood and other body fluids.

Product Portfolio

- **DM1200**

▪ **DM9600**

Strategy Overview

- The company is mainly focusing on indirect business model, selling via well-established partners. The model continually delivers increased market penetration and higher growth.
- It primarily uses internal resources for its development, but the strategy also includes development through cooperation with partners and global expansion.

9. Limitations

- The study completely based on secondary data and forecasted CAGR is calculated from historical data
- Any change in economical factors might affect the forecasted values
- Demand fluctuation might affect the forecasted value
- Study is limited by present market scenario which might get affected by future trends

10. Conclusion

- ✚ The global Hematology Analyzer market is expected to expand at a CAGR of 5.2%.
- ✚ Increasing prevalence of diseases require continuous diagnosis for controlling the diseases, which is expected to boost demand for Hematology Analyzer market over the forecast period
- ✚ Government takes initiatives to increase the capacity of laboratories—both in terms of resources and efficiency—will enhance the ability to gain advantage over rising infectious diseases.
- ✚ Drivers such as increasing diagnosis rates and R&D initiatives for complete automation by various Hematology Analyzer manufacturers will help to fuel revenue growth. Also, increasing blood donations in various developed countries propel growth of the global Hematology Analyzer market. The market is expected to be valued at US\$ 1226 (Mn US\$) by the end of 2015 owing to substantial increase in the adoption of automated Hematology Analyzers across the globe. Robust marketing and product innovation from Hematology Analyzers manufacturers are expected to fuel revenue growth

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