🎗️ Breast Cancer Patient Analysis

📌 Introduction

Breast cancer is one of the most prevalent cancers worldwide, making it essential to analyze patient data for better diagnosis and treatment. This report provides key insights into patient demographics, cancer stages, survival rates, and hormone receptor status to help understand trends and patterns among patients.

📝 Quick Procedure

- **Download Dataset** from Kaggle or other data sources.
- **Import Data into Power BI** for visualization and analysis.
- **Data Cleaning & Transformation** using **Power Query**.
- **Create Measures & Calculated Columns** for deeper insights.
- **Build Interactive Dashboards** showcasing key visualizations.
- **Analyze Key Metrics** such as survival rates, hormone status, and cancer stages.
- **Generate Reports & Insights** to support data-driven healthcare decisions.

📊 Dataset Overview

This analysis is based on a dataset containing health records of patients diagnosed with breast cancer. The data includes age, gender, tumor differentiation, hormone receptor status, and various cancer stages.

🔑 Key Dataset Attributes

- **Age:** Patients range from young adults to seniors.
- **Cancer Stages:** Patients are classified into different stages based on disease progression.
- **Tumor Differentiation:** Categorization into **well-differentiated, moderately differentiated, and poorly differentiated** tumors.
- **Hormone Receptor Status:** Presence of **estrogen and progesterone receptors**.
- **T (Tumor) and N (Node) Stages:** Classification based on tumor size and lymph node involvement.
- **Marital Status:** Categorization of patients as **married, single, divorced, widowed, or separated**.
- **Survival Rate:** Analysis of average survival months across different cancer stages.

🎯 Key Insights

📌 Patient Demographics & Cancer Stages

- 👩‍⚕️ **Average Age:** The average age of patients is **53.98 years**.
- 📈 **Cancer Stages:**
  - **Stage A** has the highest patient count (**97.7%** of cases).
  - **Stage IIA** is the most prevalent, with **1301 patients**, followed by **Stage IIB (1128 patients)**.
- 📉 **Survival Rate:** The average survival months decrease as cancer progresses to later stages.
- 📊 **Age Distribution:** The majority of cases are observed in the **50-60 years age group**.

🏥 Hormone Receptor & Tumor Analysis

- 🔬 **Tumor Differentiation:**
  - **Moderately differentiated tumors** are the most common (**2.35K patients**).
  - Poorly and well-differentiated tumors occur less frequently.
- 🧪 **Hormone Receptor Status:**
  - **82.67%** of patients are **progesterone-positive**.
  - **93.41%** of patients are **estrogen-positive**.

👫 Marital Status & Cancer Progression

- 💍 **Marital Status:**
  - **65.72%** of patients are **married**.
  - Other categories include **widowed, single, and divorced**.
- 📌 **T & N Status Analysis:**
  - **T2 Stage** has the highest patient count (~1.3K).
  - **Nodal involvement** is significant in advanced stages.
- ⚠️ **6th Stage Analysis:**
  - Survival rates decline significantly in **6th stage patients**.

🏆 Conclusion

This analysis offers a comprehensive view of breast cancer patient data, helping medical professionals and researchers improve diagnosis, treatment strategies, and patient care outcomes. By leveraging data analytics, we can move towards **better, data-driven healthcare solutions**. 🎗️💖