DATA REPORT

DATA VISUALIZATION PROJECT

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OUTLINE.

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1. INTRODUCTION.

This case study aims to analyze healthcare facility data, identify disparities in access to healthcare between rural and urban regions, and evaluate the efficiency of healthcare funding. The objective is to propose data-driven recommendations that governments and stakeholders can implement to enhance healthcare service delivery across Africa. This dataset consists of 2000 records. The analysis was conducted using Power BI Desktop, answering four key business questions, evaluating actionable insights for stakeholders and expected outcomes.

2. INFORMATION OBTAINABLE FROM THE DATASET.

From the dataset, we can extract the following key insights:

1. **Rural vs. Urban Healthcare Disparities:** This dataset provides insights into the distribution of healthcare facilities, the number of doctors and nurses, and patient accessibility across different regions.
2. **Healthcare Workforce Availability:** This dataset includes information on the availability of doctors and nurses per facility and how this varies between urban and rural locations.
3. **Patient Accessibility and Utilization:** The dataset tracks annual patient visits, average distance to facilities, and emergency response times, helping assess accessibility in different regions.
4. **Funding and Resource Allocation:** This dataset explores the funding received by healthcare facilities and their access to essential services like electricity and the internet.
5. **Patient Satisfaction and Healthcare Outcomes:** Patient satisfaction rates serve as indicators of service quality, while other factors like emergency response times help evaluate healthcare system efficiency.

3. STEPS TO IMPORTING DATA AND CREATING VISUALIZATIONS IN POWER BI.

Importing Data into Power BI.

1. I opened the Power BI Desktop.
2. I clicked on Home > Get Data > CSV
3. I located and selected the dataset file.
4. I clicked on load to import the data into Power BI.
5. I opened Power Query Editor (Transform Data) to check if the dataset needed cleaning (it didn't).
6. I clicked on add column > custom column. New column name= Urban_Rural. Custom column formula= if [Population] ≥ 10000 then “Urban”, else “Rural”
7. I clicked Close & Apply to return to the report view.

Creating Visualizations

1. **Average Funding Comparison: Urban vs. Rural (Column Chart)**

1. I inserted a Clustered Column Chart.
2. I dragged Urban_Rural to the X-axis.
3. I dragged Funding Received in USD to the Y-axis and set it to Sum.

2. Urban_Rural vs. Sum of Annual Patient Visits (Bar Chart)

1. I inserted a Clustered Bar Chart.
2. I dragged Urban_Rural to the Y-axis.
3. I dragged Annual Patient Visits to the X-axis and set it to Sum.
4. I customized labels and colours.

3. Emergency Response Time vs. Funding (Scatter Plot with Facility Type as Legend)

1. I inserted a Scatter Chart.
2. I dragged Funding received in USD to the X-axis.
3. I dragged Emergency Response Time to the Y-axis.
4. I dragged Facility Type to the Legend field.
5. I adjusted bubble sizes for better visibility.

4. Distribution of Healthcare Facilities (Urban vs. Rural) Using Stacked Bar Chart

1. I inserted a Stacked Bar Chart.
2. I dragged Facility Type to the Y-axis.
3. I dragged Facility name to the X-axis and set it to count.
4. I dragged Urban_Rural to Legend.
5. I adjusted colours to differentiate urban and rural areas.

5. Facility Type by Funding Efficiency (Bar Chart)

1. I inserted a Clustered Bar Chart.
2. I dragged Facility Type to the Y-axis.
3. Create a new measure: Funding per Patient Visit.
I Click Modeling > New Measure, then enter: Funding per Patient Visit = SUM (Funding Amount) / SUM (Annual Patient Visits)
4. I dragged the measure into the X-axis.
5. I adjusted formatting for better interpretation.

6. Healthcare Resource Allocation (Treemap)

1. I inserted a Treemap.
2. I dragged Facility Type to the category field.
3. I dragged Funding received in USD to the Values field.
4. I customized colours and labels for better readability.

4. ANSWERS TO KEY BUSINESS QUESTIONS/INSIGHTS TO VISUALIZATIONS

1. Healthcare Facility Distribution (Urban vs. Rural - Stacked Bar Chart).

Urban areas had more facilities compared to rural regions, although the difference isn't so much.
Implication: Rural areas may face accessibility challenges, requiring mobile clinics and telemedicine solutions.

2. Average Funding Comparison (Urban vs. Rural - Column Chart).

Urban healthcare facilities received more funding than rural ones.
Implication: Despite higher funding, urban facilities may still face resource strain due to high patient loads.

3. Emergency Response Time vs. Funding (Scatter chart with Facility Type as legend).

Higher funding correlated with shorter emergency response times, but some facilities still had delays. The trend line is flat, so funding has no clear impact on time.
Implication: Beyond funding, logistics and infrastructure improvements are crucial for efficiency.

4. Facility Type by Funding Efficiency (Bar Chart - Funding per Patient Visit).

Health centers and clinics showed the highest efficiency, meaning they served more patients per unit of funding. Hospitals had lower efficiency, likely due to higher operational costs and specialized care.
Implication: Expanding primary care services could improve cost efficiency and reduce hospital strain. Funding should be allocated based on service efficiency rather than just the total amount received.

5. Annual Patient Visits (Urban vs. Rural - Bar Chart).

Urban facilities had significantly higher patient visits than rural ones.
Implication: Funding allocation should consider patient volume to prevent urban facility overcrowding.

6. Healthcare Resource Allocation (Tree Map).

Hospitals received the largest funding share, followed by clinics and health centers.
Implication: Policymakers should ensure balanced allocation to strengthen primary healthcare systems.

5. ACTIONABLE INSIGHTS FOR STAKEHOLDERS.

1. **Factors Preventing Equal Access to Healthcare Across Regions**

- Fewer facilities in rural areas limit accessibility.
- High patient volumes in urban areas cause overcrowding.
- Inconsistent emergency response times due to infrastructure and logistical issues.

2. **Policy Recommendations to Bridge the Urban-Rural Healthcare Gap**

- Invest in mobile clinics and telemedicine for rural access.
- Expand funding for primary care in urban and rural areas to ease hospital burden.
- Improve transportation and emergency response systems in both regions.

3. **Optimizing Government Healthcare Funding Allocation**

- Allocate funds based on facility patient volume and efficiency metrics.
  Prioritize infrastructure improvements for rural facilities.
- Enhance emergency response services in underserved areas.

6. CONCLUSION.

The analysis revealed significant disparities in healthcare funding, accessibility, and efficiency between urban and rural regions. While urban areas received more funding, rural areas often had higher patient loads, indicating potential resource strain. Emergency response times were not always improved by higher funding, suggesting the need for strategic resource allocation. Health centers and clinics demonstrated better efficiency than hospitals, emphasizing the importance of strengthening primary healthcare services.

To bridge healthcare gaps, policymakers should prioritize equitable finding, optimize resource distribution, and enhance facility efficiency, ensuring improved healthcare access for all communities.

Below is the link to my POWER BI dashboard.

My Power BI dashboard