American Journal of Health Research
2024, Vol. 12, No. 6, pp. 154-164
https://doi.org/10.11648/j.ajhr.20241206.11

Research Article

Leveraging Pareto Analysis of Outpatient Morbidity for Strategic Drug Procurement and Health Promotion in Resource-Constrained Setting in Ghana

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Abstract

Background: Effective health management in resource-limited settings requires strategic resource allocation and intervention planning. Pareto analysis, based on the 80/20 rule, aids in identifying key health conditions impacting outpatient morbidity, guiding intervention prioritization and resource optimization. This study applied Pareto analysis on outpatient morbidity data from Goaso Government Hospital, Ghana, to identify common health conditions and improve drug procurement and health promotion strategies. The methodology also serves as a guide for applying Pareto chart analysis to enhance decision-making in healthcare delivery. Methods: A cross-sectional study was conducted analyzing outpatient department (OPD) data from January

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Received: 21 September 2024; **Accepted:** 11 October 2024; **Published:** 13 November 2024

to December 2023. Data were extracted from the Ghana Health Service Monthly Outpatient Morbidity Reports via the District Health Information Management System 2 (DHIMS 2). Data analysis was conducted using SPSS version 20 to estimate the mean and standard deviation. Microsoft Excel 2016 was employed for Pareto analysis and the creation of column charts. Results: The analysis revealed that female patients had a higher average number of outpatient cases (M = 259, SD = 430.7) compared to male patients (M = 156, SD = 282.5). Key conditions contributing to 80% of the cases included Upper Respiratory Tract Infections (URTIs), Pneumonia, Malaria, Acute Urinary Tract Infections (UTIs), Diarrhoeal diseases, Typhoid Fever, Anaemia, Rheumatism/Arthritis, Skin Diseases, and Septicaemia. Notably, young adults (ages 20-34) and children (ages 1-4) were most affected. Conclusions: A strategic approach to drug procurement is essential due to high disease prevalence. Key actions include maintaining a three-month supply of ACTs for malaria, stocking essential antibiotics, and ensuring a two-month supply of ORS. Utilizing data-driven forecasting and establishing strong supplier partnerships are crucial for optimizing drug availability. Simultaneously, targeted health promotion efforts should focus on respiratory health, malaria prevention, UTIs, WASH practices, anaemia, rheumatism, and skin diseases through public education. Additionally, qualitative research, such as patient interviews and provider surveys, is recommended to understand high morbidity rates and evaluate existing interventions.

Keywords

Pareto Analysis, Outpatient Morbidity, Resource Optimization, Disease Prevalence, Health Promotion

1. Introduction

Effective health management necessitates a strategic approach to resource allocation and intervention planning, especially in resource-constrained settings [1-3]. A significant challenge faced by healthcare systems is the inefficient management of drug procurement and health promotion activities [4]. This inefficiency is often exacerbated by the limited ability and reluctance of managers to analyze service data for informed decision-making regarding drug procurement and health promotion strategies [5, 6]. Addressing this issue requires a comprehensive analysis of outpatient morbidity patterns and trends to identify the most significant health conditions. Utilizing analytical techniques such as Pareto analysis can enable healthcare administrators to prioritize interventions and allocate resources more effectively [7].

The Pareto Principle, or the 80/20 Rule, posits that 80% of outcomes are often derived from 20% of causes [8]. Originating from Vilfredo Pareto's observation of wealth distribution in 1895, this principle was later generalized by Dr. Joseph Juran as a universal concept, applicable beyond economics to various fields, including quality management. Juran referred to the crucial few factors that contribute most significantly as the "vital few," contrasted with the "trivial many," which have a lesser impact [9]. This principle has been successfully applied in various fields to identify critical issues and guide decision-making processes [10, 11]. In healthcare, Pareto analysis can be particularly useful for analyzing morbidity data to determine the most prevalent conditions contributing to outpatient visits [12]. Understanding the disease patterns allows for targeted drug procurement and health promotion strategies that address the most pressing health concerns.

While Pareto analysis is known to offer valuable insights into prevalent health issues and improve resource allocation, its use in outpatient morbidity data is still limited, both at Goaso Government Hospital and globally. Previous research indicates that systematic analysis of outpatient data can enhance the targeting of health interventions [13]. However, few studies have applied this approach to pinpoint and address the most predominant conditions [8, 9].

A methodical approach to drug procurement and health promotion strategies is crucial in Goaso Government Hospital, Ghana, where resources are constrained and challenges include a high disease burden and inadequate infrastructure [4]. This study therefore applied Pareto analysis to outpatient morbidity data from local health facilities to identify the most common conditions. The aim was to generate actionable recommendations for refining drug procurement processes and enhancing health promotion strategies. Additionally, the methodology presented serves as a guide for effectively using Pareto chart analysis to analyze OPD morbidity data to improve decision-making in health care delivery.

2. Materials and Methods

2.1. Study Setting

The study was conducted at Goaso Government Hospital in Goaso, Ghana. Established in 1950 as a dispensary, the facility was upgraded to a health centre in 1962 and further elevated to a municipal hospital in 1987. Currently, Goaso Government Hospital operates as a 118-bed facility with a workforce of 678 staff members. In 2022, it provided medical care to approximately 60,000 patients [14], offering a range of services including emergency, outpatient, and inpatient care.

The hospital serves as a critical healthcare provider in the Ahafo Region, addressing both routine and acute medical needs within the community.

2.2. Study Design

This investigation was a cross-sectional observational study focused on morbidity analysis. It examined secondary OPD data from January 2023 to December 2023.

2.3. Study Population, Sample Size, Inclusion Criteria and Sampling Method

The study focused on all outpatient morbidity records for Goaso Government Hospital during the study period. This included all patients who utilized outpatient services and had their morbidity data entered from January to December 2023. A total of 19,928 outpatient morbidity records were analyzed, representing the cumulative morbidity data recorded throughout the year 2023. This approach provided a comprehensive overview of outpatient morbidity patterns at Goaso Government Hospital.

Purposive sampling was employed to include all outpatient morbidity records from January to December 2023. This method ensured that the dataset comprehensively represented the outpatient morbidity cases for the entire year.

The inclusion criteria encompassed all morbidities listed in the Ghana Health Service (GHS) monthly outpatient (OPD) morbidity reports with at least one reported case in the DHIMS database. Conditions listed in the GHS reports with zero reported cases in DHIMS were excluded from the analysis.

2.4. Data Extraction and Cleaning

The primary data source was the dataset report section of the DHIMS 2 database (accessible at: *https://dhims.chimgh.org/dhims*). In Ghana, the DHIMS2 was introduced as a nationwide tool for systematic health data collection and analysis. The system was developed by the Ghana Health Service in collaboration with the University of Oslo. DHIMS2 is a web-based platform designed to aggregate data from various levels of the health system into a centralized repository. It employs data warehouse principles and features a modular framework, allowing for customization to meet the specific needs of different health systems [15]. Morbidity data were extracted from this database, which contained detailed records of various medical conditions and the total number of OPD cases reported. This dataset formed the basis for the analysis. To ensure accuracy and reliability, the data underwent a thorough cleaning process using Microsoft Excel version 2016.

The data was first imported into Excel. Discrepancies, inconsistencies, and missing values were identified and corrected using Excel's data validation and conditional formatting features. Duplicate entries were checked and removed. Misreported values were corrected, and missing data was filled in where possible. Outliers were carefully examined and either corrected or removed if they were deemed errors. This meticulous cleaning process was crucial for maintaining data integrity and ensuring reliable results.

2.5. Data Organization and Categorization

After cleaning, the data was organized into a structured format in Microsoft Excel. Each medical condition was listed with its corresponding total number of cases. This structured organization facilitated sorting the conditions in descending order of case numbers. The use of Excel's sorting and filtering functions streamlined this process, allowing for efficient data management and preparation for further analysis.

Morbidity data were categorized into broad disease groups for analysis. The categorization for the study is detailed in *Supplementary 2.*

Overall, the use of Microsoft Excel version 2016 for data extraction, cleaning, and organization provided a solid foundation for analysis. This ensured that the findings accurately reflected the distribution of outpatient cases and supported effective prioritization of health conditions for strategic decision-making.

2.6. Data Analysis

2.6.1. Calculation of Age Group-Specific Morbidity Percentages

To summarize the morbidity data for various age groups, we first calculated the percentage of total morbidity for each group using the formula Percentage = (Total Cases ÷ Total Morbidity) x100, where Total Morbidity is 19,928. This involved computing the proportion of cases in each age group relative to the total number of cases. For instance, the percentage for the age group 1-4 years was calculated as (3484 ÷19,928) x 100 = 17.5%. These percentages were then used to construct a bar chart, visually representing the distribution of morbidity across different age groups, highlighting the relative impact of each age group on the total morbidity.

2.6.2. Analysis of Mean and Standard Deviation in Outpatient Cases by Gender

Analyzing outpatient cases for male and female patients involved calculating the mean and standard deviation to understand healthcare utilization patterns. For each gender group, outpatient case numbers were collected from 48 patients. A one-sample t-test was conducted to assess whether the mean scores of males and females on the measured variable significantly differed from zero. The analysis included 48 participants from each group, evaluating their average scores, standard deviations, and confidence intervals

to determine statistical significance and support the hypotheses.

Null Hypothesis (H_0): $\mu Male = \mu Female$

Alternative Hypothesis (H_1): $\mu Male \neq \mu Female$

Where μMale and μFemale represent the cases' means of the measured variable for males and females, respectively.

2.6.3. Cumulative Total Cases and Percentage Calculation

We computed the cumulative total cases for each condition to understand their collective impact. The cumulative total cases were calculated using the formula:

$$\text{Cumulative Total Cases}i = \text{Total Cases}i + \text{Cumulative Total Cases}i\text{-}1$$

Where, Total Casesi denotes the number of cases for the current condition *i*, and Cumulative Total Cases$i-1$ represents the cumulative total cases of the preceding condition.

To determine the cumulative percentage of total OPD cases attributable to each condition, we used the formula:

$$Cumulative\ Percentage = \left(\frac{Cumulative\ Total\ Cases}{Total\ Morbidity}\right) \times 100$$

Where Total Morbidity was the total number of OPD cases (19,928) across all conditions. The calculations for the study are detailed in *Supplementary 1*.

2.6.4. Pareto Chart Construction

We created a Pareto chart with conditions displayed on the x-axis, arranged in descending order of their frequency. A bar graph was used to show the number of OPD cases for each condition, and a line graph on a secondary y-axis displayed the cumulative percentage. A horizontal line at the 80% cumulative percentage threshold was included to identify the conditions that cumulatively account for 80% of the total OPD cases.

To interpret the Pareto chart, conditions were initially sorted in descending order based on the number of outpatient cases, with each condition represented as a bar on the chart. These bars displayed the frequency of each condition, while a cumulative percentage line, plotted on a secondary y-axis, illustrated the progressive accumulation of these frequencies. This cumulative line was essential for understanding the distribution of cases among different conditions.

The analysis revealed a clear distinction between the 'vital few' and the 'trivial many.' Specifically, a small subset of conditions accounted for the majority of outpatient cases, with the cumulative percentage line showing that these conditions were responsible for 80% of the total morbidity cases, per the Pareto principle. This 80% threshold was indicated by a horizontal line on the chart, highlighting the conditions with the most significant impact on outpatient morbidity.

Focusing on these high-impact conditions the 'vital few' the analysis allowed for the identification of key health issues that were both prevalent and had a substantial effect on healthcare utilization. This targeted approach facilitated the development of strategic recommendations for drug procurement and health promotion. Prioritizing interventions for these major conditions aimed to optimize resource allocation and improve healthcare management. The insights gained from the Pareto chart were pivotal in guiding decision-making and formulating strategies to enhance overall healthcare delivery and outcomes.

3. Results

3.1. Descriptive Statistics of Outpatient Cases by Gender

The one-sample t-test results reveal that both males and females have mean scores significantly greater than 0. Males had a mean score of 155.96 (SD = 282.47) with a t-value of 3.83 and a p-value of less than .001, indicating strong statistical significance; the 95% confidence interval for the mean difference ranged from 73.94 to 237.98. In comparison, females scored higher, with a mean of 259.21 (SD = 430.67), a t-value of 4.17, and a p-value also below .001; their confidence interval ranged from 134.15 to 384.26. (Table 1).

Table 1. *Descriptive Statistics of Outpatient Cases by Gender, Goaso Government Hospital, 2023*.

Sex	N	Mean	Std. Deviation	Std. Error Mean	t	df	p-value	95% Confidence Interval
Male	48	155.96	282.473	40.772	3.825	47	< .001	[73.94, 237.98]
Female	48	259.21	430.672	62.162	4.17	47	< .001	[134.15, 384.26]

N: Number of participants, t: t-value from the t-test, df: Degrees of freedom

3.2. Distribution of Outpatient Morbidity by Age Group

The analysis of OPD morbidity data reveals that the highest percentage of total morbidity was found in the age group of 20-34 years, which accounts for 22.6% of all cases. Children aged 1-4 years also represent a substantial portion, with 17.5% of the total morbidity. In contrast, the percentage of total morbidity decreases in older age groups, with the 35-49 year group contributing 13.0%, while the percentages for those aged 50-59, 60-69, and 70+ years are 7.6%, 6.2%, and 6.5%, respectively. The age group under 28 days represents a minimal fraction of total morbidity at just 0.1%. These findings highlight a peak in morbidity among young children and young adults, with a gradual decline in older age groups, reflecting varying healthcare needs across different stages of life (Figure 1).

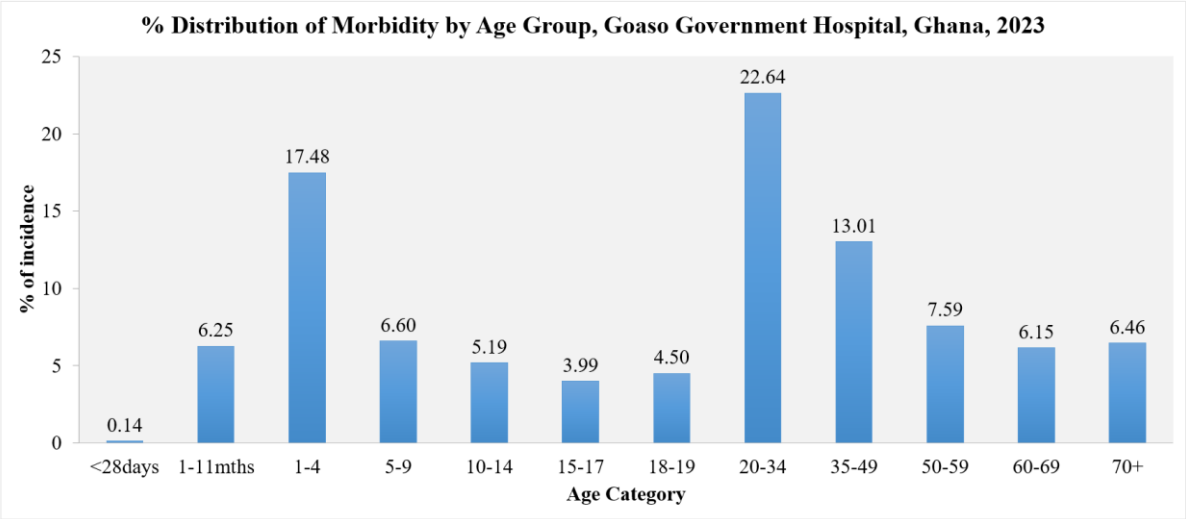

Figure 1. *Distribution of Outpatient Morbidity by Age Group, Goaso Government Hospital, 2023.*

3.3. Distribution of OPD Cases by Disease Category

The hospital's OPD disease distribution shows that communicable non-immunizable diseases are the most prevalent, comprising 58.9% of cases. Specialized conditions follow at 22.1%, indicating significant demand for specialized care. Non-communicable diseases account for 14.7%, reflecting a notable presence of chronic conditions. Obstetrics and gynaecological issues make up 3.7%, while injuries, mental health conditions, and reproductive tract diseases each constitute very small proportions (0.3%, 0.2%, and 0.1%, respectively). Overall, the data highlights a major focus on communicable diseases in the outpatient setting, with lesser emphasis on other health categories (Figure 2).

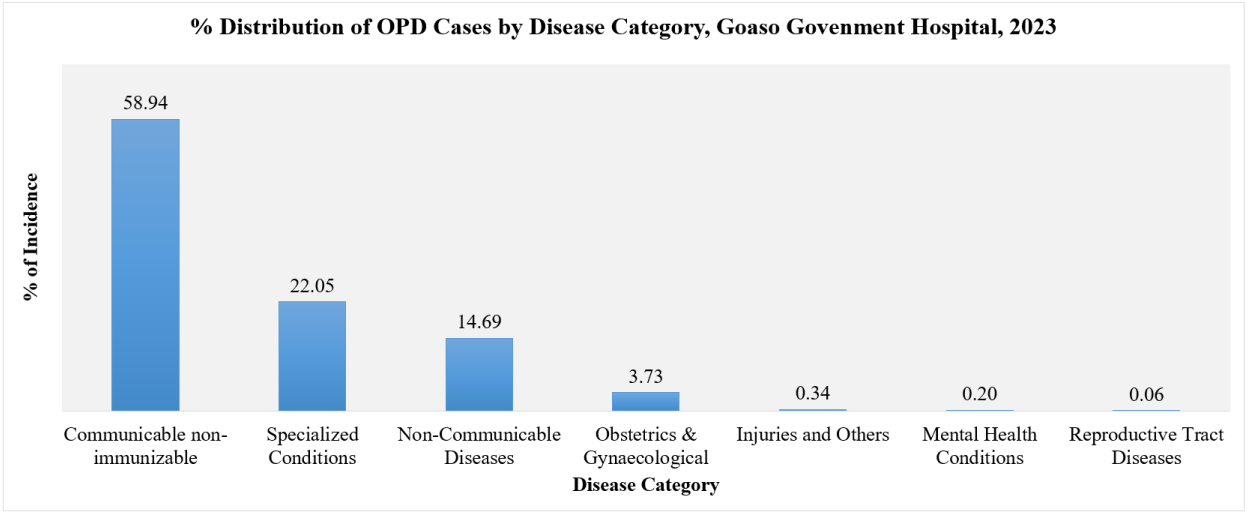

Figure 2. *Distribution of OPD Cases by Disease Category, Goaso Government Hospital, 2023.*

3.4. Pareto Analysis of Outpatient Cases by Top

Applying the Pareto Principle to the OPD case data demonstrates that approximately 80% of the outpatient cases are attributable to a relatively small subset of conditions. Specifically, the top ten conditions—upper Respiratory Tract Infections, Pneumonia, Malaria, Acute Urinary Tract Infections, Diarrhea Diseases, Typhoid Fever, Anemia, Rheumatism/Other Joint Pains/Arthritis, Skin Diseases, and Septicaemia—collectively account for 16,029 cases, which represents 80.5% of the total 19,928 OPD cases (Figure 3).

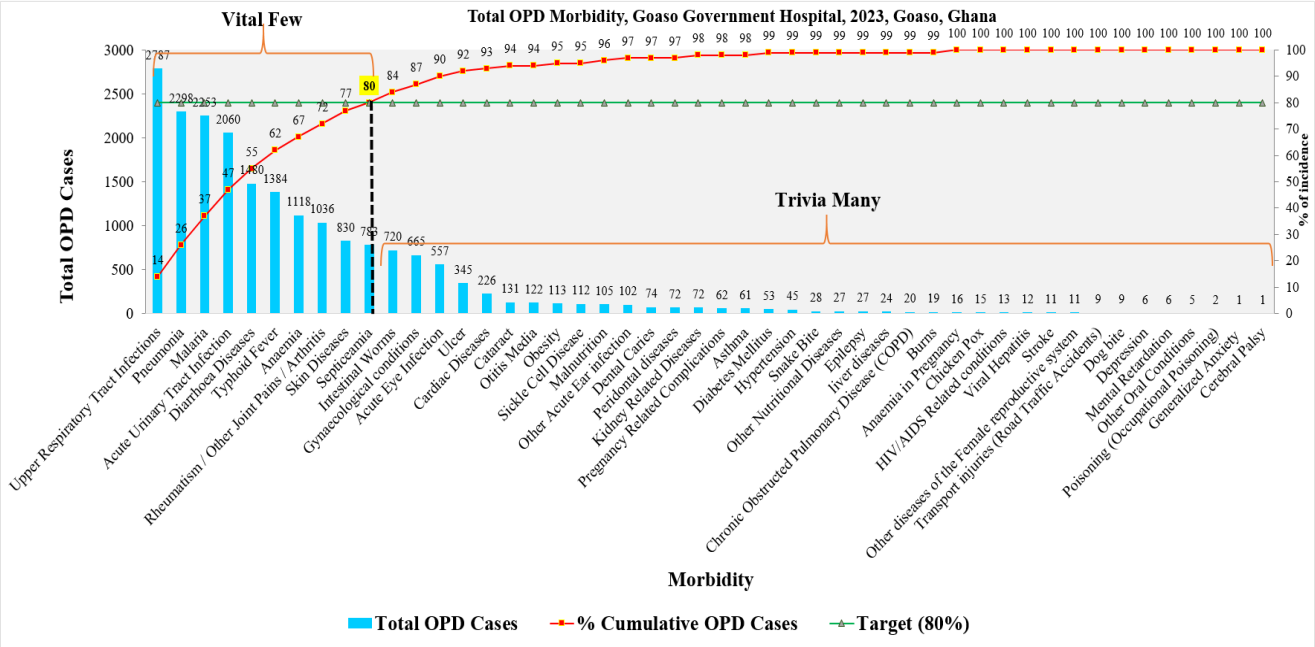

Figure 3. *Pareto Analysis of Outpatient Cases by Top Conditions, Goaso Government Hospital, 2023.*

4. Discussion

The analysis of outpatient morbidity data from Goaso Government Hospital reveals a substantial gender disparity in the frequency of outpatient visits. Female patients show a higher average number of cases compared to male patients. This disparity is supported by previous research in a Tertiary Hospital in Southwest Nigeria, which shows that women often have higher morbidity rates for respiratory and infectious diseases [16]. This may be partly due to biological factors such as hormonal differences, which can influence susceptibility to infections and chronic conditions. Additionally, socio-environmental factors such as gender roles and responsibilities may contribute to higher exposure to health risks and barriers to accessing healthcare [17].

In contrast, a study from Malawi reported that women, due to underutilization of essential medical services, exhibit lower recorded morbidity rates despite facing greater challenges in obtaining financial assistance for community healthcare [18]. This disparity may be attributable to variations in healthcare infrastructure, economic conditions, and cultural practices across regions. In areas with limited healthcare resources, women may encounter greater barriers to accessing care, which could influence morbidity rates and healthcare utilization patterns differently compared to those observed in Goaso.

The data also indicated a notable concentration of outpatient cases among young adults (ages 20-34) and children (ages 1-4), indicating a significant prevalence of health issues in this demographic. This finding underscores the need for age-specific health interventions. Research supports the idea that these age groups are particularly susceptible to certain health conditions. For example, Rouf et al. (2016), emphasize the vulnerability of young adults and children to specific diseases and the benefits of tailored health management programs [19]. Young adults may be particularly affected by lifestyle-related diseases and respiratory infections, while children are more vulnerable to infectious diseases and nutritional deficiencies. Tailoring public health initiatives to these age groups could involve strategies such as improving childhood vaccination coverage, promoting healthy lifestyle choices among young adults, and enhancing access to age-appropriate health services. Addressing the unique health needs of these populations could lead to a substantial reduction in the burden of prevalent diseases and improve overall health outcomes in the community.

The Pareto analysis reveals that a small number of health conditions account for the majority of outpatient cases, specifically including Upper Respiratory Tract Infections, pneumonia, malaria, Acute Urinary Tract Infections, Diarrhoeal diseases, typhoid fever, Anaemia, rheumatism/arthritis, skin diseases, and Septicaemia. This distribution adheres to the Pareto principle, which posits that a minority of causes often account for the majority of effects [8]. This principle has been observed in various healthcare settings, where a few prevalent conditions contribute disproportionately to overall morbidity [20]. The concentration of cases among these conditions suggests that focused interventions could significantly reduce the overall disease burden. Targeted prevention strategies, such as vaccination programs, improved sanitation, and vector control measures, could address these predominant health issues effectively. Notably, the 2024 health promotion annual action plan for Goaso Government Hospital (see *Supplementary 3*) did not address the identified morbidities responsible for approximately 80% of the health issues in the hospital's catchment area. This omission may illustrate a broader issue observed by Odei-Lartey et al., (2020), who found that health data are frequently underutilized in decision-making processes aimed at improving healthcare services [15]. Their study, which assessed the use of data from DHIMS2 at district, sub-district, and community levels, underscores the challenge of translating data into actionable strategies for enhancing health outcomes.

Conversely, the findings from Goaso differ from those observed in a Tertiary Care Hospital in Bangladesh, where the leading health conditions differed from those identified in this study [21]. Such differences may be influenced by geographical and environmental factors, such as the prevalence of specific pathogens or the effectiveness of local public health measures. Regional disparities in health conditions highlight the importance of localized data for designing effective healthcare interventions.

5. Conclusions

This study used Pareto analysis to assess outpatient morbidity data from Goaso Government Hospital. It found that few conditions, such as URTIs, Pneumonia, Malaria, and Acute UTIs, account for most outpatient cases. The analysis also revealed significant gender disparities, with females experiencing more cases on average, and highlighted that young adults and children are particularly affected. To address these issues, strategic drug procurement and health promotion is crucial. Ensuring a steady supply of antimalarial, antibiotics, and oral rehydration solutions is essential. Targeted health promotion should focus on improving respiratory health, preventing malaria, and addressing other prevalent conditions through public education. Future research should include qualitative studies, such as patient interviews and provider surveys, to better understand high morbidity rates and evaluate the effectiveness of current interventions.

6. Recommendations

6.1. Strategic Drug Procurement and Supply Management for Goaso Government Hospital

In light of the high prevalence of specific conditions identified in the analysis, Goaso Government Hospital should implement a strategic approach to drug procurement to address these needs effectively. The study underscores the necessity for a reliable and consistent supply of essential medications to manage prevalent health conditions efficiently [22].

For malaria management, it is critical to maintain a three-month supply of ACTs [23]. This proactive measure will help prevent stock-outs and ensure uninterrupted treatment for patients. Given the significant burden of malaria, maintaining an adequate supply of ACTs is essential to manage and control this condition effectively [24].

The hospital should also prioritize the procurement of antibiotics such as Amoxicillin, Azithromycin, and Ceftriaxone. These antibiotics are crucial for treating URTIs and pneumonia [25, 26]. Stock-outs of these antibiotics can lead to treatment delays, which can adversely affect patient outcomes and prolong recovery times. Therefore, ensuring a steady supply of these medications is vital.

Additionally, maintaining a two-month supply of ORS is necessary for the effective management of Diarrhoeal diseases. Shortages of ORS can lead to severe dehydration and associated complications, particularly in vulnerable populations such as young children [27]. Adequate stock levels of ORS will be essential in preventing such complications and ensuring timely treatment.

To optimize drug procurement, the hospital should adopt data-driven forecasting methods. Predictive analytics, utilizing historical data and identifying seasonal trends, can offer valuable insights into future drug needs. This approach will enable more accurate forecasting and better alignment of drug supply with actual demand. Furthermore, establishing robust partnerships with pharmaceutical suppliers will be critical. Strong relationships with suppliers can ensure the timely delivery of medications and help maintain adequate stock levels. By implementing these strategies, Goaso Government Hospital can mitigate the risk of drug shortages, enhance treatment continuity, and improve overall patient care.

6.2. Targeted Health Promotion and Education Strategies

In light of the high prevalence of the identified conditions,

targeted health promotion and education strategies are essential. Public health campaigns should focus on enhancing respiratory health by improving indoor air quality and promoting good hygiene practices. Education on the impact of air pollutants and the benefits of proper ventilation and vaccination can help reduce the incidence of respiratory infections.

For malaria prevention, community-based initiatives should emphasize the use of insecticide-treated bed nets, mosquito repellents, and environmental management to eliminate mosquito breeding sites [28]. Public education on malaria prevention and the importance of prompt treatment and prophylactic measures is also crucial [29].

Efforts to reduce UTIs should include promoting personal hygiene, proper toileting practices, and safe water access [30]. Educational programs addressing the impact of agricultural pollutants on water quality can further help reduce UTI incidence.

Improving water, sanitation, and hygiene (WASH) practices is essential to prevent Diarrhoeal diseases and typhoid fever [31]. Community education should focus on clean drinking water, proper food handling, and regular handwashing. Emphasizing the importance of adequate sanitation and water treatment will help mitigate the risk of these diseases.

Addressing anaemia requires nutrition education programs that focus on iron-rich diets and regular screening for vulnerable populations, such as children and pregnant women [32].

For managing rheumatism and arthritis, public health initiatives should educate individuals on ergonomic practices, preventive measures for joint stress, and lifestyle modifications [33]. Improving housing conditions to reduce exposure to cold and damp environments can also help alleviate joint pain.

Preventing skin diseases involves enhancing personal hygiene, reducing exposure to agricultural chemicals, and promoting safe handling practices [34]. Education on seeking medical care for persistent skin issues is also important.

Finally, preventing Septicaemia requires promoting early treatment of infections, appropriate antibiotic use, and improved sanitation and hygiene practices to prevent infections from progressing to sepsis [35].

In summary, implementing targeted drug procurement strategies and health promotion programs based on the identified morbidity patterns will be crucial for improving healthcare delivery and health outcomes in Goaso. By addressing the most prevalent conditions and focusing on the needs of specific age groups, the healthcare system can enhance its response to the most pressing health challenges in the region.

7. Study Strengths and Limitations

The study at Goaso Government Hospital employs Pareto analysis to effectively identify the most prevalent health conditions among outpatient visits, revealing that a small subset of conditions such as Upper Respiratory Tract Infections, pneumonia, malaria, and UTIs account for the majority of cases. This approach aligns with the Pareto principle, emphasizing that a minority of causes often drive the majority of effects [8], thereby offering crucial insights for health strategic planning. It aids in directing resources and interventions toward the most impactful conditions, which can enhance health outcomes and optimize healthcare delivery. However, the study's reliance on Pareto analysis presents a limitation, as the methodology's applicability and validation in outpatient settings are not extensively established in the literature, potentially limiting the generalizability of the findings to other contexts. Future research should validate Pareto analysis in diverse outpatient environments to improve its robustness and applicability. Despite this, the study's insights are highly relevant for health strategic planning, particularly in prioritizing resource allocation, tailoring health promotion programs, ensuring strategic drug procurement, and addressing gender-specific health disparities.

Abbreviations

ORS	Oral Rehydration Salts
ACTs	Artemisinin-based Combination Therapies
WASH	Water, Sanitation, and Hygiene

Supplementary Material

The supplementary material can be accessed at https://doi.org/10.11648/j.ajhr.20241206.11

Ethical Considerations

Throughout the study, patient confidentiality was rigorously maintained, and no direct patient interviews were conducted. The research utilized secondary data extracted from the DHIMS 2 database. Permission for the study was obtained from the Goaso Government Hospital authorities. As the study did not involve direct interaction with human subjects, it did not require ethical approval from review boards or committees.

Acknowledgments

We extend our sincere gratitude to the management members of the Asunafo North District Health Directorate and the Goaso Government Hospital for their invaluable support and collaboration throughout this study. We also wish to thank all the participants for their time and willingness to contribute to this research. Their cooperation and insights were essential to the success of the study.

Author Contributions

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Funding

This work is not supported by any external funding.

Data Availability Statement

The data is available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

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Biography

Richmond Bediako Nsiah is a key member of the Public Health Department at the Asokore Mampong Municipal Health Directorate. He holds a Master of Public Health (Health Information) and has accumulated valuable experience as a consultant for JSI on the USAID MRITE and Global Vax projects over the past two years. Richmond has further enhanced his expertise with professional certificates in Monitoring and Evaluation, Project Management, and Leadership and Management, all obtained through the University of Washington's distance learning program. In his current role, he mentors healthcare professionals on Geo-enabled digital micro-planning to improve healthcare delivery and oversees health information systems and data management practices. Richmond also leads a group of young health practitioners dedicated to improving health service delivery through research.

Research Fields

Richmond Bediako Nsiah: Health information management, Data management practices, Maternal and child health research, Immunization program evaluation, Health access disparities.

Patrick Larbi-Debrah: Maternal health interventions, Immunization, Infectious disease control, Health access disparities, Health system strengthening.

James Ankamah: Non-communicable disease prevention, Chronic disease management, Public health surveillance, Health access disparities, Epidemiology of chronic conditions.

Akua Kumi Yeboah: Maternal and child nutrition, Reproductive health services, Child immunization, Health education programs, Health access disparities.

Theresah Krah: Communicable disease epidemiology, Health crisis management, Health access disparities, Public health preparedness, Disease outbreak response.

Isaac Ayirebi: Health program evaluation, Maternal health strategies, Health access disparities, Health systems research, Community health initiatives.

Frank Prempeh: Non-communicable disease research, Health policy analysis, Health access disparities, Lifestyle disease prevention, Chronic disease epidemiology.

Charlotte Yeboah Domfeh: Maternal and child health services, Health access disparities, Immunization coverage rates, Pediatric health interventions, Maternal health outcomes.

Florence Owusuaa Peprah: Child health services, Health data integration, Public health interventions, Health access disparities, Disease prevention strategies.

Mark Bonnir: Child health services, Communicable disease surveillance, Vaccination programs, Maternal health research, Health access disparities.

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