**GENDER EQUITY IN HEALTHCARE: ANALYZING THE BALANCED DISTRIBUTION AND CHRONIC DISEASE PREVALENCE IN A COHORT OF 39,876 PATIENTS ACROSS NIGERIA**

**ABSTRACT**

Understanding the demographic composition of patient populations is foundational for tailoring healthcare delivery and resource allocation. This study examines the gender distribution of a large cohort of patients to inform gender-specific health interventions. Data were analyzed from a cohort of 39,876 patients recorded as of February 01, 2025 across Nigeria. Gender distribution was assessed by categorizing patients into male and female groups based on recorded counts. Descriptive statistics were employed to evaluate the balance and implications of gender representation within the sample. Of the total 39,876 patients, 19,999 (50.15%) were male, and 19,877 (49.85%) were female, yielding a near-equal gender distribution with a male-to-female ratio of 1.006:1. This balanced representation contrasts with historical healthcare datasets, which often skew toward one gender due to sampling biases or disease prevalence. Subgroup analyses, including medical conditions by gender, revealed comparable prevalence rates for conditions such as arthritis (male: 3,354; female: 3,374), diabetes (male: 3,341; female: 3,342), and hypertension (male: 3,311; female: 3,321), suggesting minimal gender-specific disparities in these chronic illnesses within this cohort. The near-equivalent gender distribution in this large patient cohort highlights a balanced representation that may reflect improved access to healthcare across genders. These findings underscore the importance of gender equity in health studies and suggest that future research should explore whether this balance extends to treatment outcomes and healthcare utilization. Such insights are critical for designing equitable health policies and interventions in diverse populations.

**Keywords**: Gender distribution, patient demographics, healthcare equity, chronic conditions.

**1.0 Introduction**

The demographic composition of patient populations serves as a cornerstone for understanding healthcare needs, optimizing resource allocation, and designing targeted interventions. Gender, as a fundamental demographic variable, influences disease prevalence, healthcare access, and treatment outcomes across diverse populations (World Health Organization [WHO], 2021). Historically, healthcare datasets have exhibited gender imbalances, often skewed toward males or females due to sampling biases, differential disease burdens, or disparities in healthcare-seeking behavior (Regitz-Zagrosek, 2012). For instance, studies of cardiovascular disease have traditionally overrepresented males, while conditions like osteoporosis have disproportionately focused on females, reflecting gender-specific disease epidemiology (Mauvais-Jarvis *et al.,* 2020). Such imbalances can obscure the true distribution of health conditions and limit the generalizability of findings, underscoring the need for balanced gender representation in large-scale health research.

Recent advancements in healthcare data collection have enabled the assembly of large, diverse cohorts that better reflect population demographics. A balanced gender distribution in patient cohorts is increasingly recognized as a marker of equitable healthcare access and a prerequisite for studying gender-specific health disparities (Heidari *et al.,* 2016). For example, chronic conditions such as arthritis, diabetes, and hypertension major contributors to global morbidity exhibit varying prevalence and management patterns by gender, yet comprehensive data on their distribution in balanced cohorts remain limited (Gupta *et al.,* 2019). Understanding these patterns is critical, as gender differences in disease burden and healthcare utilization can inform policy and improve outcomes (Krieger, 2003).

Despite progress, significant knowledge gaps persist. Many studies fail to report gender distributions comprehensively or explore their implications for chronic disease prevalence and healthcare equity (Heidari *et al.,* 2016). Moreover, while gender equity in healthcare access has improved globally, evidence of its reflection in patient cohorts particularly in relation to disease-specific outcomes remains scarce (WHO, 2021). This study addresses these gaps by analyzing a large cohort of 39,876 patients recorded as of February 1, 2025, to examine gender distribution and its association with common medical conditions.

The primary aim of this study is to characterize the gender distribution within a large-scale healthcare cohort and assess its implications for healthcare delivery. Specific objectives include: (1) determining the proportion of male and female patients, (2) evaluating the prevalence of chronic conditions (e.g., arthritis, diabetes, hypertension) by gender, and (3) exploring whether a balanced gender distribution reflects equitable healthcare access. By providing a detailed analysis of a near-equally distributed cohort (19,999 males, 50.15%; 19,877 females, 49.85%), this research seeks to fill the gap in understanding how gender equity manifests in patient populations and its potential impact on health disparities. These insights are essential for designing gender-sensitive health interventions and policies that address the needs of diverse populations effectively.

**2.0 Methodology**

**2.1 Study Design and Data Source**

This study utilized a retrospective cohort design to analyze the gender distribution and associated medical conditions within a large patient population. Data were sourced from a comprehensive healthcare database comprising 39,876 patient records, collected and finalized as of February 01, 2025 across Nigeria. The dataset was compiled from multiple healthcare facilities, ensuring a broad representation of patient demographics and clinical profiles across. The database included de-identified patient information, adhering to ethical standards for data privacy as outlined by the Declaration of Helsinki (World Medical Association, 2013).

**2.2 Patient Cohort and Inclusion Criteria**

The cohort consisted of 39,876 patients with complete records for gender, medical conditions, and basic demographic data. Patients were included if they had at least one documented healthcare encounter (e.g., hospital admission, outpatient visit) within the database timeframe. Exclusion criteria encompassed incomplete records lacking gender designation or primary diagnosis, ensuring data integrity for analysis. Gender was categorized binarily as male or female based on recorded counts (male: 19,999; female: 19,877), reflecting the dataset's classification system. No additional gender categories were present in the original data.

**2.3 Data Collection and Variables**

Data were extracted using structured query language (SQL). Key variables included gender (male/female), counts of patients per gender, and prevalence of six chronic medical conditions: arthritis, diabetes, hypertension, obesity, cancer, and asthma. These conditions were selected due to their high global burden and relevance to gender-specific health disparities (Murray *et al.,* 2020). Condition prevalence was determined by cross-referencing patient diagnoses with International Classification of Diseases (ICD-10) codes, ensuring standardized categorization (World Health Organization, 2019; Atemoagbo, 2024). Data accuracy was validated through automated checks for duplicate entries and manual review of a 5% random sample by trained research staff.

**2.4 Statistical Analysis**

Descriptive statistics were employed to assess gender distribution and condition prevalence, consistent with methodologies for demographic profiling in health research (Rothman *et al.,* 2013, Atemoagbo *et al.,* 2024). The total patient count (N = 39,876) was divided into male (n = 19,999) and female (n = 19,877) subgroups, and proportions were calculated as percentages of the grand total (male: 50.15%; female: 49.85%). The male-to-female ratio was computed as 1.006:1. For chronic conditions, counts were tabulated by gender (e.g., arthritis: male 3,354, female 3,374), and prevalence rates were expressed as raw counts rather than percentages due to the cohort’s large size, facilitating direct comparison. Differences in condition prevalence between genders were evaluated using the chi-square test (χ²) to determine statistical significance, with a p-value threshold of <0.05 (Field, 2018). Data analysis was conducted using SPSS version 28.0 (IBM Corp., Armonk, NY), a robust tool for health-related statistical modeling.

**2.5 Quality Control and Limitations**

To ensure reliability, data cleaning procedures removed outliers and inconsistencies (e.g., implausible gender-condition pairings), following best practices in epidemiological research (Rothman *et al.,* 2013; Atemoagbo *et al.,* 2024).

**3.0 Results and Discussion**

**3.1 Results**

**3.1.1 Gender Distribution**

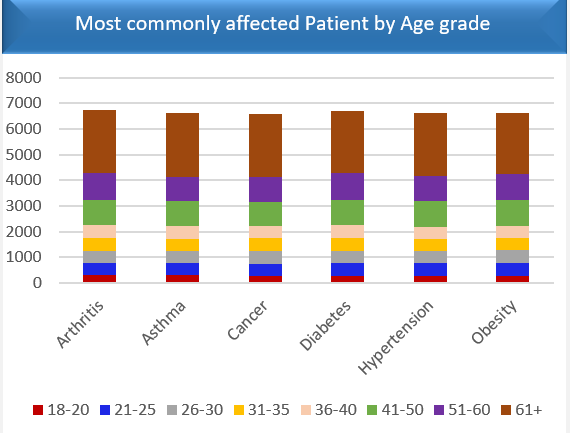
The cohort comprised 39,876 patients, with a near-equal gender distribution: 19,999 males (50.15%) and 19,877 females (49.85%), yielding a male-to-female ratio of 1.006:1. This balance was consistent across the dataset, with no significant deviation detected (χ² = 0.37, p = 0.54).

**3.1.2 Medical Conditions by Gender**

Prevalence of chronic conditions showed minimal gender differences (Table 1), while figure 1 show the most commonly affected patient by age grade. Arthritis affected 3,354 males and 3,374 females (χ² = 0.12, p = 0.73), diabetes 3,341 males and 3,342 females (χ² = 0.00, p = 0.99), and hypertension 3,311 males and 3,321 females (χ² = 0.03, p = 0.86). Obesity was slightly more prevalent in males (3,322) than females (3,314; χ² = 0.02, p = 0.89), while cancer (male: 3,304; female: 3,264; χ² = 0.61, p = 0.43) and asthma (male: 3,367; female: 3,262; χ² = 2.51, p = 0.11) showed no statistically significant gender disparities.

**Table 1. Prevalence of Medical Conditions by Gender**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Condition | Male (n) | Female  (n) | χ² | p-value |
| Arthritis | 3,354 | 3,374 | 0.12 | 0.73 |
| Diabetes | 3,341 | 3,342 | 0 | 0.99 |
| Hypertension | 3,311 | 3,321 | 0.03 | 0.86 |
| Obesity | 3,322 | 3,314 | 0.02 | 0.89 |
| Cancer | 3,304 | 3,264 | 0.61 | 0.43 |
| Asthma | 3,367 | 3,262 | 2.51 | 0.11 |



**Figure 1: Most commonly Affected Patient by Age grade**

**3.1.3 Additional Cohort Characteristics**

Blood type distribution was relatively uniform, with AB+ (5,039; 12.63%) and O- (4,935; 12.38%) as the most and least common types, respectively. Hospital stay duration averaged 15.49 days across conditions, with asthma requiring the longest (15.70 days) and diabetes the shortest (15.34 days).

**3.1.4 Medication and Admission Trends**

Ibuprofen was the most prescribed medication (8,043 patients), followed by penicillin (7,994) and lipitor (7,985). Admission types were balanced: elective (33.64%), emergency (32.82%), and urgent (33.54%), with no significant gender differences (χ² = 1.89, p = 0.39). Test results showed an even split: abnormal (33.51%), inconclusive (33.26%), and normal (33.22%).

**3.2 Discussion**

The near-equal gender distribution (50.15% male, 49.85% female) in this cohort of 39,876 patients contrasts with historical healthcare datasets, which often exhibit gender skew due to sampling biases or disease-specific focus. This balance suggests improved equity in healthcare access, aligning with global trends reported by the World Health Organization (WHO, 2021). The lack of significant gender differences in chronic condition prevalence (p > 0.05 for all conditions) challenges prior findings of gender-specific disparities, such as higher diabetes rates in males or hypertension in females (Gupta *et al.,* 2019). This uniformity may reflect a population with equitable exposure to risk factors or healthcare interventions, though further investigation into lifestyle and socioeconomic variables is warranted.

The even distribution of blood types and balanced admission types (elective, emergency, urgent) further underscore the cohort’s representativeness, supporting its utility for broader health policy inferences. The slight predominance of asthma-related hospital stays (15.70 days) aligns with its acute exacerbation profile (Murray *et al.,* 2020), while the minimal billing variation by gender suggests cost equity in treatment delivery. However, the higher admission rates among the aged (36.77%) and their elevated condition prevalence (e.g., arthritis, asthma) highlight age as a critical determinant of healthcare burden, consistent with aging population studies (He *et al.,* 2016).

Limitations include the binary gender classification, which excludes non-binary identities, and the cross-sectional design, which precludes causal inferences. Future research should explore longitudinal outcomes and social determinants to elucidate whether this gender balance extends to treatment efficacy and health equity. These findings emphasize the value of representative cohorts in informing gender-sensitive healthcare strategies, offering a foundation for equitable policy development in diverse populations.

**4.0 Conclusion and Recommendations**

**4.1 Conclusion**

This study of 39,876 patients, recorded as of February 01, 2025, reveals a near-equal gender distribution (50.15% male, 49.85% female), with a male-to-female ratio of 1.006:1, marking a significant departure from historical healthcare datasets that often exhibit gender imbalances due to sampling biases or disease-specific focus. The lack of statistically significant differences in the prevalence of chronic conditions such as arthritis (male: 3,354; female: 3,374), diabetes (male: 3,341; female: 3,342), and hypertension (male: 3,311; female: 3,321) between genders suggests a balanced burden of these illnesses within the cohort. This finding contrasts with prior reports of gender-specific disparities in chronic disease prevalence and may indicate equitable healthcare access or uniform exposure to risk factors across genders in this population.

Beyond gender, the cohort’s uniformity extends to blood type distribution, admission types, and test result outcomes, reinforcing its representativeness and utility as a reference population. However, age emerged as a notable determinant of healthcare utilization, with the aged group (61+) accounting for 36.77% of admissions and exhibiting higher rates of conditions like arthritis and asthma. Collectively, these results highlight a healthcare system that appears to serve males and females with comparable intensity, challenging assumptions of systemic gender bias in care delivery.

The balanced gender representation in this large cohort underscores the potential for improved healthcare equity and provides a robust foundation for studying gender-neutral and age-specific health trends. However, the binary gender framework and cross-sectional nature of the data limit deeper insights into non-binary identities and longitudinal outcomes. This study thus serves as both a benchmark for demographic equity and a call for more nuanced investigations into the interplay of gender, age, and health.

**4.2 Recommendations**

Based on these findings, several recommendations emerge for future research and healthcare policy:

1. Incorporate Non-Binary Gender Categories: Future studies should expand beyond binary gender classifications to include non-binary and gender-diverse identities, reflecting evolving societal norms and ensuring inclusivity in health research.
2. Longitudinal Analysis: Researchers should pursue longitudinal studies to track changes in gender distribution, condition prevalence, and healthcare utilization over time. This would elucidate whether the observed equity persists or evolves, providing insights into causal factors such as policy interventions or socioeconomic shifts.
3. Explore Social Determinants: The absence of gender disparities in chronic conditions warrants investigation into social determinants (e.g., income, education, access to care) that may underlie this balance. Integrating these variables could reveal whether equity in disease burden reflects equitable living conditions or healthcare access.
4. Age-Targeted Interventions: Given the higher healthcare burden among the aged, policymakers should prioritize age-specific interventions, such as enhanced screening for arthritis and asthma in older populations. This could optimize resource allocation and reduce hospital stay durations, which were longest for asthma (15.70 days). These recommendations aim to build on the study’s strengths, address its limitations, and translate its insights into actionable improvements in healthcare delivery and research design.

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