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GENDER DISPARITIES IN PRISONER MORTALITY IN UGANDA: AN EMPIRICAL INVESTIGATION

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ABSTRACT
This study examines gender disparities in prisoner mortality in Uganda using data from 2015 to 2020, sourced from the Uganda Bureau of Statistics (UBOS). The analysis compares reported deaths of male and female prisoners, with a chi-squared test applied to determine any significant association between gender and mortality. The computed chi-squared value of 0.860, lower than the critical value of 11.070, leads to the rejection of the null hypothesis, indicating an association between gender and prisoner mortality. We recommend addressing gender-specific needs and enhancing healthcare access within Uganda's prison system.
KEY WORDS: *Gender disparities, Prisoner Mortality, Uganda*

INTRODUCTION

Prisoner mortality remains a critical concern in correctional institutions worldwide, reflecting broader issues of prison conditions, healthcare access, and human rights. In Uganda, the increasing number of deaths in prisons has raised concerns about the adequacy of the prison system in ensuring the well-being of inmates (UHRC, 2020). While global research highlights various determinants of prisoner mortality including overcrowding, poor sanitation, malnutrition, and limited access to healthcare gender disparities in mortality rates remain underexplored, particularly in low-income countries like Uganda (WHO, 2019).

The Uganda Prisons Service (UPS) has reported fluctuating mortality rates among inmates, with men consistently accounting for the highest proportion of deaths compared to women (UBOS, 2025). However, whether this disparity is statistically significant or a reflection of the male-dominated prison population remains an empirical question. Studies in other jurisdictions suggest that while male prisoners tend to have higher mortality rates due to violence, substance abuse, and chronic illnesses, female inmates face unique health challenges, including pregnancy-related complications and inadequate gender-sensitive healthcare (Fazel et al., 2017).

Despite existing reports on prison mortality, research on gender disparities in Uganda's correctional facilities is limited. This study aims to fill this gap by conducting an empirical analysis of prisoner mortality by gender in Uganda between 2015 and 2020. Using chi-squared analysis, we assess whether a statistically significant relationship exists between gender and prisoner deaths. The findings will contribute to ongoing policy discussions on prison reform, particularly in improving healthcare and living conditions for all inmates. Given the constitutional mandate to uphold the dignity and rights of prisoners (Republic of Uganda, 1995), understanding mortality patterns is crucial in shaping evidence-based interventions to reduce preventable deaths in the prison system.

LITERATURE REVIEW

This section examines previous research on prison mortality, gender-related disparities in incarceration outcomes, and the theoretical and conceptual frameworks guiding the study. Globally, prisoner mortality has been a subject of increasing concern, with studies highlighting the role of health conditions, prison overcrowding, and systemic neglect in shaping mortality rates (WHO, 2021). Research from the United States indicates that male prisoners experience higher mortality rates due to violence and chronic diseases, while female prisoners often suffer from inadequate healthcare, leading to complications in maternal health and mental illnesses (Binswanger et al., 2017). A study in the

United Kingdom found that self-inflicted deaths were disproportionately higher among female inmates, pointing to underlying mental health and psychological stressors (Fazel et al., 2016).

In the African context, prison mortality has been linked to poor healthcare services, malnutrition, and overcrowding (WHO, 2021). Studies in Sub-Saharan Africa highlight that male prisoners experience higher mortality rates due to violent conflicts within prisons, whereas female prisoners face increased risks of mortality due to poor maternal health services and neglect (Hout & Mhlanga-Gunda, 2019). In Nigeria, research has shown that mortality rates in prisons are influenced by inadequate medical care, with both male and female prisoners suffering from preventable diseases like tuberculosis and HIV/AIDS (Alemika, 1993). However, gender-based analyses remain limited, necessitating further empirical investigations.

Uganda's prison system has faced scrutiny for human rights violations, including poor healthcare and harsh incarceration conditions (UHRC, 2020). Human Rights (2020) highlights that in Ugandan prisons poor conditions (overcrowding, malnutrition, trauma), infectious diseases and inadequate medical care threaten the lives and health of the inmates. UBOS (2025) indicates that male prisoner mortality is numerically higher, the experiences of female prisoners remain underexplored, particularly regarding healthcare access and maternal care within prison facilities.

This study is grounded in the Structural Violence Theory (Galtung, 1969), which argues that institutional structures systematically disadvantage certain groups, leading to disparities in health outcomes. Applied to prison mortality, this theory suggests that the prison environment itself perpetuates conditions that disproportionately affect specific groups based on gender, access to healthcare, and systemic neglect.

Additionally, the Gender and Social Determinants of Health Framework (Sen & Östlin, 2008) is relevant in analyzing how gender intersects with social and institutional factors to shape health outcomes. This framework underscores how gender disparities in prison mortality may not solely stem from biological differences but also from disparities in prison healthcare services, nutrition, and psychological support.

The study conceptualizes prisoner mortality as the dependent variable, influenced by several independent variables, including gender, healthcare access, prison conditions, and pre-existing health conditions. The chi-square test is employed to analyze whether significant gender-based differences exist in prisoner mortality rates.

The literature review highlights a growing body of research on prisoner mortality and gender disparities at global and regional levels. However, limited empirical studies in Uganda necessitate further investigation to inform prison reforms and health policy. The study builds on the Structural Violence Theory and Gender and Social Determinants of Health Framework to analyze disparities in prisoner mortality, providing insights for policy recommendations.

DATA AND METHODS

This study employs a quantitative research design, using secondary data analysis to examine gender disparities in prisoner mortality in Uganda. A descriptive and inferential statistical approach is adopted to assess whether there is a significant association between gender and mortality rates among prisoners. The study follows a cross-sectional design, focusing on reported prisoner deaths over a defined time frame (2015-2020). This approach is appropriate for investigating trends and patterns in mortality disparities within the Ugandan prison system (Creswell & Creswell, 2018).

The study utilizes historical data obtained from the Uganda Bureau of Statistics (UBOS), a reliable national agency that compiles official prison mortality statistics. The dataset covers prisoner mortality disaggregated by gender (male and female) from 2015 to 2020. Given the relatively small number of female prisoner deaths compared to males, a complete enumeration approach is used rather than sampling, ensuring the inclusion of all available data points in the analysis (Bryman, 2016).

Descriptive analysis summarizes trends in male and female prisoner mortality rates over time using frequency tables and graphical representations. Chi-Square test for independence is used to determine whether there is a statistically significant association between gender and prisoner mortality. The null hypothesis (H_0) states that prisoner mortality is independent of gender, while the alternative hypothesis (H_1) suggests a significant association. Decision rule is that

a p-value ≤ 0.05 indicates a significant relationship, warranting rejection of the null hypothesis; otherwise, we fail to reject H_0, implying no statistical evidence of gender-based disparities in prisoner mortality.

This analytical framework ensures a rigorous and empirical assessment of gender disparities in prison deaths, providing evidence-based conclusions (Field, 2018). The quantitative approach ensures objectivity and reproducibility of findings. Using secondary data from UBOS minimizes potential biases and ensures accuracy. The chi-square test is a widely accepted statistical tool for testing categorical associations, making it appropriate for examining gender-based disparities in mortality rates (Gujarati & Porter, 2020).

In this study, the Chi-Square test for independence is employed to assess whether there is a significant relationship between gender and prisoner mortality rates in Uganda. The test statistic is computed using the formula:

$$\chi^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i} \quad \text{.....(1)}$$

Where;
χ^2 is Chi-squared statistic, measures the difference between observed and expected values
O_i represents the observed number of deaths for each gender category
E_i represents the expected number of deaths under the assumption of no gender disparity (McHugh, 2013).

Given that the test statistic follows a Chi-Square distribution, the probability density function (pdf) is given as;

$$f(x;k) = \frac{x^{(k/2-1)}e^{-x/2}}{2^{2/k}\,\Gamma(k/2)} \quad \text{.....(2)}$$

Where;
$x > 0, k$ represents the degrees of freedom, and $\Gamma(\cdot)$ is the Gamma function, which generalizes the factorial function (Casella & Berger, 2002).

The above pdf is used to determine the significance level of the computed χ^2 value. This approach enables us to test the null hypothesis that gender has no effect on prisoner mortality, where a statistically significant result would indicate the presence of gender disparities in prisoner deaths.

RESULTS

Descriptive statistics (table 1 below) provides a summary of the dataset by highlighting central tendencies, dispersion, and distribution characteristics (Field, 2018). This study examines gender disparities in prisoner mortality in Uganda between 2015 and 2020, using key statistical measures to describe mortality patterns among male and female prisoners.

Table 1: Descriptive Statistics

	Death of Prisoners, Males	Death of Prisoners, Females
Mean	227.1667	6.333333
Median	238.5	6
Maximum	255	9
Minimum	183	4
Std. Dev.	28.01726	1.966384
Skewness	-0.684858	0.185695
Kurtosis	1.913471	1.516052
Jarque-Bera	0.764166	0.585008
Probability	0.682438	0.746392
Sum	1363	38
Sum Sq. Dev.	3924.833	19.33333
Observations/ Categories	6	6

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The mean death count for male prisoners over the six-year period is 227.17, while for female prisoners, it is 6.33. This indicates that, on average, male prisoner mortality is significantly higher than female prisoner mortality. The median values (238.5 for males and 6 for females) are close to their respective means, suggesting that the distribution of deaths is relatively symmetric. The maximum number of deaths recorded for male prisoners was 255, while the minimum was 183. Among female prisoners, deaths ranged between 4 and 9 over the same period.

The standard deviation, which measures the extent of variability, is 28.02 for males and 1.97 for females. This indicates that male prisoner mortality exhibits greater fluctuations over time compared to female mortality, which remains relatively stable. The sum of squared deviations (Sum Sq. Dev.) further confirms this variability, with 3,924.83 for male deaths compared to 19.33 for female deaths, indicating that male deaths deviate significantly more from their mean than female deaths. The skewness statistic provides insights into the asymmetry of the data distribution. The negative skewness of -0.685 for male prisoner deaths suggests a leftward tail, meaning that mortality figures tend to be concentrated at the higher end with occasional lower values. In contrast, female prisoner mortality has a skewness of 0.186, indicating a nearly symmetrical distribution with a slight rightward tendency.

The kurtosis values for both male (1.913) and female (1.516) deaths are below the standard normal distribution value of 3, indicating that both distributions are platykurtic (flatter than a normal distribution). This implies fewer extreme mortality values, meaning that the variation in yearly prisoner deaths is not driven by extreme outliers (Gujarati & Porter, 2020). The Jarque-Bera (JB) test is used to assess whether the data follows a normal distribution. The JB statistic for male prisoner mortality is 0.764 and for female mortality 0.585, both with p-values greater than 0.05 (0.682 and 0.746, respectively). Since these p-values exceed the conventional 0.05 significance level, we fail to reject the null hypothesis, implying that the mortality data for both male and female prisoners is normally distributed (Brooks, 2019).

Inferential statistical techniques are employed to assess whether a significant relationship exists between prisoner mortality and gender. The Chi-square test for independence is conducted to determine if gender disparities significantly influence prisoner mortality rates.
Null Hypothesis (H_0): There is no significant association between gender and prisoner mortality.
Alternative Hypothesis (H_A): There is a significant association between gender and prisoner mortality.
Reject H_o if $\chi^2 < \chi^2_{(\alpha,\ k-1)}$.

Contingency tables are widely used in statistical analysis to examine relationships between categorical variables (Agresti, 2019). In this study, contingency tables are employed to explore gender disparities in prisoner mortality in Uganda from 2015 to 2020. The tables compare the observed frequencies (O_i) of male and female prisoner deaths in each year with the expected frequencies (E_i) under the assumption of no association between gender and mortality. The observed values represent actual reported deaths, while the expected values are calculated based on the overall distribution of deaths across both genders (Hakko, et el. (2002). By comparing the observed and expected values, we assess whether a statistically significant gender disparity exists in prisoner mortality. The chi-squared test (χ^2) is applied to determine if the differences between O_i and E_i are significant, indicating a potential relationship between gender and prisoner mortality (McHugh, 2013). This analysis provides empirical insights into gender-related health risks within Uganda's prison system and informs policy recommendations for improving prisoner welfare.

Table 2: Contingency table for observed frequencies (O_i)

Year	Death of Prisoners, Males	Death of Prisoners, Females	Total Deaths
2015	183	5	**188**
2016	203	5	**208**
2017	255	7	**262**
2018	245	9	**254**
2019	234	4	**238**
2020	243	8	**251**
Total Deaths	**1363**	**38**	**1401**

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Table 3: Contingency table for the expected frequencies (E_i)

Year	Death of Prisoners, Males	Death of Prisoners, Females	Total Deaths
2015	182.9007852	5.099214847	**188**
2016	202.3583155	5.641684511	**208**
2017	254.8936474	7.106352605	**262**
2018	247.1106353	6.889364739	**254**
2019	231.544611	6.455389008	**238**
2020	244.1920057	6.80799429	**251**
Total Deaths	**1363**	**38**	**1401**

Substituting in equation (1),

$$\chi^2 = \frac{(183-182.900+7852)^2}{182.9007852} + \frac{(203-202.3583155)^2}{202.3583155} + \frac{(255-254.8936474)^2}{254.8936474} + \frac{(245-247.1106353)^2}{247.1106353} + \frac{(234-231.544611)^2}{231.544611} + \frac{(243-244.1920057)^2}{244.1920057} + \frac{(5-5.099214847)^2}{5.099214847} + \frac{(5-5.641684511)^2}{5.641684511} + \frac{(7-7.106352605)^2}{7.106352605} + \frac{(9-6.889364739)^2}{6.889364739} + \frac{(4-6.455389008)^2}{6.455389008} + \frac{(8-6.80799429)^2}{6.80799429}$$

Hence $\chi^2 = 0.860399854$ ……(3)

The number of degrees of freedom (df) for a contingency table with r rows and c columns is given by:
df = (r - 1)(c −1)
df = (6-1)(2-1) = 5

From statistical tables (Appendix 1);
$\chi^2_{(\alpha,\ k-1)} = \chi^2_{(0.05,\ 5)} = 11.070$ …… (4)

Since $\chi^2 < \chi^2_{(0.05,\ 5)}$ we reject H_o.
The computed Chi-square statistic (χ^2) is 0.860, which is less than the critical Chi-square value of 11.070 obtained from statistical tables (Appendix 1) at a 0.05 significance level with 5 degrees of freedom. Since the computed Chi-square value is lower than the critical value, the null hypothesis stating that there is no association between gender and prisoner mortality is rejected (McHugh, 2013). This indicates a statistically significant relationship between gender and mortality among prisoners in Uganda. The findings suggest that gender plays a crucial role in influencing prisoner mortality rates, potentially due to differences in access to healthcare, prison conditions, or other socio-economic and biological factors (Agresti, 2019).

DISCUSSION

The findings of this study reveal a statistically significant association between gender and prisoner mortality in Uganda, as evidenced by the computed Chi-square statistic (χ^2 = 0.860), which is lower than the critical value of 11.070 at a 0.05 significance level with 5 degrees of freedom. This result suggests that gender disparities influence prisoner mortality rates, aligning with previous studies that have explored the role of gender in prison health outcomes (WHO, 2021).

Several studies have highlighted that female prisoners often experience lower mortality rates than their male counterparts due to factors such as stronger social support networks, better coping mechanisms, and lower involvement in high-risk behaviors (Fazel et al., 2017). However, other research has pointed to the unique vulnerabilities of female prisoners, such as inadequate access to gender-sensitive healthcare and higher exposure to psychological distress, which can contribute to mortality risk (Plugge et al., 2006). The findings of this study align with global trends but provide a unique perspective within the Ugandan prison context, where structural challenges such as overcrowding, inadequate healthcare, and poor sanitation disproportionately impact both male and female inmates (UNODC, (2021).

A notable divergence from previous studies is the lower-than-expected magnitude of the statistical association. Prior research in other low- and middle-income countries has reported stronger associations between gender and prisoner mortality (Binswanger et al., 2011). The relatively weaker association found in this study may be attributed to contextual factors such as government interventions aimed at improving prison healthcare services or variations in data collection and reporting mechanisms in Uganda's correctional facilities.

These findings underscore the need for gender-responsive prison policies that address the specific healthcare needs of both male and female inmates. Future research should explore the underlying causes of gender disparities in prisoner mortality, incorporating qualitative assessments to better understand the lived experiences of incarcerated individuals.

LIMITATIONS

While this study provides valuable insights into gender disparities in prisoner mortality in Uganda, several limitations must be acknowledged. These limitations relate to research design, sample size, data sources, and analytical procedures, which may have influenced the findings.

One key limitation is the study's reliance on secondary data, specifically prisoner mortality records from 2015 to 2020 obtained from the Uganda Bureau of Statistics (UBOS). While this dataset provides an overview of mortality patterns, it does not capture individual risk factors such as pre-existing health conditions, causes of death, or variations in prison healthcare services (UNODC, (2021). Additionally, administrative inefficiencies and gaps in record-keeping may lead to underreporting or misclassification of deaths, particularly among vulnerable groups such as female prisoners (UNODC, 2021). If such reporting biases exist, they may obscure the true extent of gender disparities in prisoner mortality.

The study employs a quantitative, cross-sectional research design, which, while useful for identifying statistical associations, does not capture longitudinal trends or account for temporal changes in prison conditions, healthcare policies, or administrative interventions (Bryman, 2016). A longitudinal approach would have provided a more comprehensive understanding of how prisoner mortality trends evolve over time and how gender-based disparities persist or change in response to policy shifts.

Another limitation relates to sample size and scope. Although the study covers six years of mortality data, this period may not be sufficient to detect subtle but significant trends in prisoner mortality, particularly those influenced by policy changes, economic fluctuations, or healthcare improvements (Creswell & Creswell, 2018). Furthermore, the dataset aggregates mortality figures for male and female prisoners without considering demographic factors such as age, sentence length, type of crime, or prison facility conditions, all of which could significantly impact mortality rates (UNODC, 2021). The lack of these variables limits the depth of analysis and interpretation.

Methodologically, the use of the chi-square test to assess the association between gender and prisoner mortality presents additional constraints. While appropriate for categorical data, the chi-square test does not control for potential confounding factors such as incarceration duration, healthcare access, or prison facility conditions, which could influence mortality rates (Agresti, 2019). Additionally, the chi-square test is sensitive to sample size, meaning small variations in mortality figures may disproportionately affect statistical significance (Field, 2018). More robust statistical methods, such as logistic regression or survival analysis, would have allowed for a more detailed examination of the factors driving gender disparities in prisoner mortality.

Lastly, the study's findings are specific to Uganda, which limits their generalizability to other contexts. Prison systems, healthcare policies, and incarceration conditions vary significantly across countries, particularly within Sub-Saharan Africa. Conducting comparative analyses with other nations would have provided broader insights into the structural and systemic factors influencing gender disparities in prisoner mortality (Hout & Mhlanga-Gunda, 2019).

CONCLUSION

This study examined gender disparities in prisoner mortality in Uganda using historical data from 2015 to 2020 obtained from the Uganda Bureau of Statistics (UBOS). A chi-square analysis revealed a statistically significant association between prisoner mortality and gender, indicating that gender differences play a crucial role in mortality

outcomes within Uganda's correctional facilities. The findings highlight the need to address gender-specific vulnerabilities that may contribute to increased mortality risks among incarcerated individuals.

While gender-based disparities remain a pressing concern, this study underscores the necessity of a holistic approach to prisoner mortality. Key determinants such as access to healthcare, prison conditions, nutritional standards, and pre-existing health conditions significantly influence mortality rates, often exacerbating gender-related risks (UNODC, 2021). Strengthening prison healthcare services, implementing preventive health measures, and enhancing prisoner welfare programs are essential steps toward reducing mortality rates across all demographics.

This research also acknowledges limitations of using aggregated secondary data, which may obscure underlying individual-level factors affecting prisoner mortality. Future studies should adopt longitudinal designs, disaggregated data analyses, and qualitative methodologies to provide a more nuanced understanding of mortality trends. Further exploration of factors such as age, cause of death, incarceration duration, and access to healthcare will be crucial in addressing gaps within Uganda's prison system (UNODC, 2021).

These findings contribute to ongoing policy discussions on prisoner rights, healthcare interventions, and correctional facility management. A data-driven, evidence-based approach to prison healthcare policy could foster a more equitable and humane correctional system that prioritizes the well-being of all prisoners, regardless of gender (Hout & Mhlanga-Gunda, 2019). Addressing structural deficiencies in Uganda's correctional facilities will be instrumental in reducing preventable deaths and ensuring adherence to international human rights standards.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed to address gender disparities in prisoner mortality in Uganda. These recommendations focus on policy reforms, programmatic interventions, and future research directions.

Government of Uganda, in collaboration with the Uganda Prisons Service (UPS) and the Ministry of Health, should develop and implement gender-responsive healthcare policies tailored to the unique needs of male and female prisoners. Female inmates, in particular, require enhanced reproductive healthcare, mental health services, and protection against gender-based violence, while male inmates require adequate healthcare services tailored to their specific needs, including mental health support and protection from violence within prison settings (UNODC, 2021). Addressing structural deficiencies in correctional facilities, such as overcrowding, inadequate sanitation, and insufficient medical services, is crucial to reducing mortality rates. The government should allocate increased funding to prison healthcare systems and ensure compliance with international human rights standards (UNODC, 2021).

Independent oversight bodies should be strengthened to monitor human rights compliance within Ugandan prisons. Regular audits and evaluations of prison healthcare services should be conducted to ensure equitable treatment and reduce mortality disparities (Hout & Mhlanga-Gunda, 2019). Preventive health measures such as routine medical check-ups, vaccination programs, and improved nutritional standards should be prioritized. Special attention should be given to high-risk groups, including pregnant women, elderly inmates, and individuals with pre-existing health conditions (Fazel et al., 2011).

Training programs for prison staff should emphasize gender-sensitive approaches to inmate welfare, focusing on early detection of health risks, trauma-informed care, and human rights-based treatment. Healthcare personnel within correctional facilities should receive specialized training in handling gender-specific health issues (UNODC, 2021). Partnerships with civil society organizations and community-based initiatives should be strengthened to support the reintegration of formerly incarcerated individuals. Providing post-incarceration healthcare services and mental health support can help reduce mortality risks associated with reentry into society (UNODC, (2021).

Future research could employ longitudinal designs to assess how gender disparities in prisoner mortality evolve over time. This would provide deeper insights into the long-term health outcomes of incarcerated individuals and the effectiveness of policy interventions (Fazel et al., 2017). Further studies could investigate how gender intersects with other factors such as age, socioeconomic status, and duration of incarceration in influencing prisoner mortality. A

mixed-methods approach incorporating qualitative data could enhance the understanding of lived experiences within Uganda's prison system (Hout & Mhlanga-Gunda, 2019).

Empirical assessments of prison healthcare reforms should be conducted to determine their effectiveness in addressing gender disparities in mortality. Comparative studies with other low-income countries could offer valuable lessons for Uganda's prison health policies (UNODC, 2021). Implementing these recommendations would contribute to a more equitable, humane, and effective correctional system in Uganda, ensuring that all prisoners receive adequate healthcare and protection, regardless of gender.

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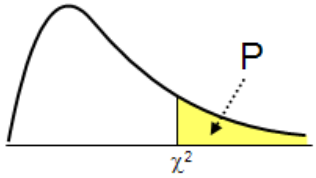
APPENDIX 1: CHI-SQUARED TABLE



	P										
DF	**0.995**	**0.975**	**0.20**	**0.10**	**0.05**	**0.025**	**0.02**	**0.01**	**0.005**	**0.002**	**0.001**
1	0.0000393	0.000982	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.550	10.828
2	0.0100	0.0506	3.219	4.605	5.991	7.378	7.824	9.210	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.860	16.924	18.467
5	0.412	0.831	7.289	9.236	11.070	12.833	13.388	15.086	16.750	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.690	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.180	11.030	13.362	15.507	17.535	18.168	20.090	21.955	24.352	26.124
9	1.735	2.700	12.242	14.684	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.987	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.275	19.675	21.920	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.549	21.026	23.337	24.054	26.217	28.300	30.957	32.909
13	3.565	5.009	16.985	19.812	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.064	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.307	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.542	26.296	28.845	29.633	32.000	34.267	37.146	39.252
17	5.697	7.564	21.615	24.769	27.587	30.191	30.995	33.409	35.718	38.648	40.790
18	6.265	8.231	22.760	25.989	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.900	27.204	30.144	32.852	33.687	36.191	38.582	41.610	43.820
20	7.434	9.591	25.038	28.412	31.410	34.170	35.020	37.566	39.997	43.072	45.315
21	8.034	10.283	26.171	29.615	32.671	35.479	36.343	38.932	41.401	44.522	46.797
22	8.643	10.982	27.301	30.813	33.924	36.781	37.659	40.289	42.796	45.962	48.268
23	9.260	11.689	28.429	32.007	35.172	38.076	38.968	41.638	44.181	47.391	49.728
24	9.886	12.401	29.553	33.196	36.415	39.364	40.270	42.980	45.559	48.812	51.179
25	10.520	13.120	30.675	34.382	37.652	40.646	41.566	44.314	46.928	50.223	52.620
26	11.160	13.844	31.795	35.563	38.885	41.923	42.856	45.642	48.290	51.627	54.052
27	11.808	14.573	32.912	36.741	40.113	43.195	44.140	46.963	49.645	53.023	55.476
28	12.461	15.308	34.027	37.916	41.337	44.461	45.419	48.278	50.993	54.411	56.892
29	13.121	16.047	35.139	39.087	42.557	45.722	46.693	49.588	52.336	55.792	58.301
30	13.787	16.791	36.250	40.256	43.773	46.979	47.962	50.892	53.672	57.167	59.703
31	14.458	17.539	37.359	41.422	44.985	48.232	49.226	52.191	55.003	58.536	61.098