2022 Liberia Population and Housing Census

Thematic Report on

Fertility
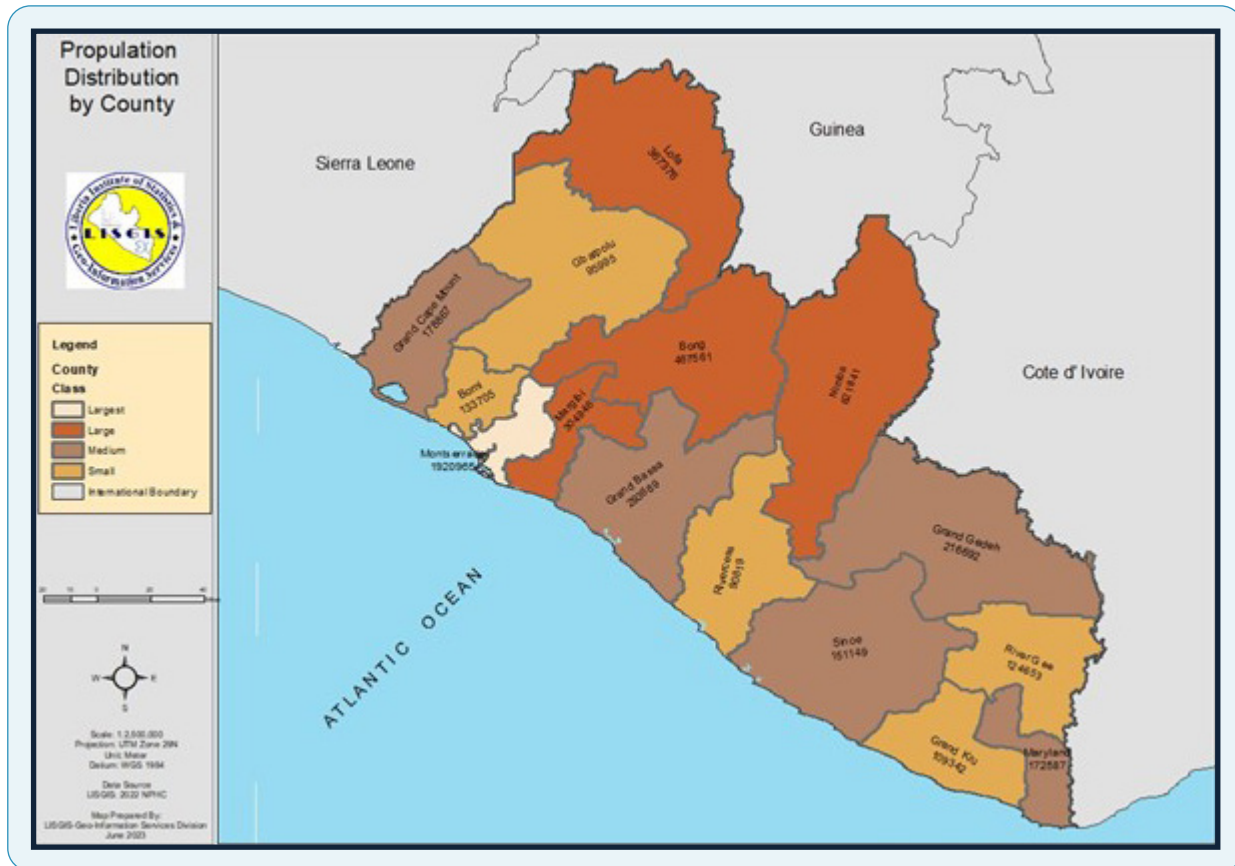
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Administrative map of Liberia

Foreword

The 2022 National Population and Housing Census is the fifth and first digital census with the full deployment of ICT techniques and followed the UN Recommended Principles for the 2020 round of censuses. The basis for the conduct of the census is Article 39 of the 1986 Constitution of the Republic of Liberia. On October 10, 2022, the Government of Liberia initiated "an Act Authorizing the Executive Branch of Government to conduct the 2022 Liberia Population and Housing Census".

Hence, following the successful implementation of the 2022 Liberia Population and Housing Census, the Liberia Institute of Statistics & Geo-Information Services (LISGIS) produced 14 thematic reports. These reports summarized the country's demographic, social, and economic sectors. The publication of the thematic reports is consistent with the United Nations (UN) International Standards of releasing National Census results and thematic reports.

The 14 thematic reports form a primary source of socio-economic and demographic data at various levels and provide relevant information to foster national development, good governance, and resource distribution. The results presented in this thematic report will form a solid basis for the successes and challenges in the implementation of the Sustainable Development Goals (SDGs) as well as support the implementation of the development of the Africa Union Agenda 2063: The Africa We Want; Transforming Our World and other national and international programs.

I am pleased that the thematic reports helped to guide our national development plan. I would like to appreciate the support received from development partners and individuals during the entire process of writing the thematic report.

On behalf of the Census Commission and Board of Directors of LISGIS, I thank the Government of Liberia and our development partners for providing the required resources for conducting the census. Thanks also go to the national and international experts who worked very hard to complete these thematic reports.

Special appreciation for the success of the census goes to Hon. Samuel D. Tweah, Jr., former Chairman of the Census Commission, the Census Commission, the Steering Committee, the Census Secretariat, other national and international experts, census staff, and all respondents who provided the required information as well as all stakeholders for their commitment, motivation, and support to the National Population and Housing Census process.

I look forward to the continued support and guidance of development partners to engender sustainable development in our country.

Hon. Dehpue Y. Zuo
**Deputy Minister for Economic Management
& Chairman of the Board**
Ministry of Finance and Development Planning

Preface

The Liberia Institute of Statistics & Geo-Information Services (LISGIS) conducted the fifth and first fully digital census in November 2022. The 2022 National Population and Housing Census data was collected using Computer Assisted Personal Interviewing (CAPI) technology. Data were collected using tablets and later transmitted to LISGIS's server electronically.

The 14 thematic areas identified provide a comprehensive understanding of the population. These thematic areas are a) Population Distribution and Size b) Children, Adolescents, and Youth c) People with disabilities and older people d) Migration and Urbanization e) Labor force and Employment, f) Education, and Literacy g) Agricultural Population, h) Non-monetary poverty i) Housing conditions and facilities j) Mortality, k) Fertility, l) Marriages/Nuptiality, m) Gender Dimensions, and n) Population Projections. I would also like to thank the national and international experts for preparing the thematic reports.

Though the Government contributed immense resources to the 2022 National Census exercise, the requirements were enormous and beyond the capacity of the Government and LISGIS. It is with pleasure that we recognize and appreciate the support of the United Nations Population Fund (UNFPA), the Swedish Government, the World Bank, the United States Aid for International Development (USAID), the Irish Government, the Government of Ghana, Economic Community of West African States (ECOWAS) and the United Nations Children's Fund (UNICEF) and other partners whose timely and continuous interventions gave stimulus to the execution of the 2022 Liberia Population and Housing Census including the preparation of the reports.

Special gratitude goes to the general public for their cooperation and support. We are indebted to personnel and the management of LISGIS, national and international experts, supervisors, and enumerators for successfully conducting the 2022 National Population and Housing Census.

Richard F. Ngafuan
Director General
LISGIS

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List of abbreviations

ASFR	Age-Specific Fertility Rate
ABR	Adolescent Birth Rate
CBR	Crude Birth Rate
CIP	Costed Implementation Plan
CEB	Children Ever Born
DTT	Demographic Transition Theory
FP	Family Planning
GoL	Government of Liberia
GRR	Gross Reproduction Rate
MCPR	Modern Contraceptive Prevalence Rate
MAC	Mean Age at Childbearing
LPHC	Liberia Population and Housing Census
LFR	Late Fertility Rate
TFR	Total Fertility Rate
NRR	Net Reproduction Rate
SDG	Sustainable Development Goals
WRA	Women of Reproductive Age
WWD	Women with Disabilities

Fact sheet

Indicator	Estimate	
	2008	**2022**
Reported Births	-	63,001
Women of Reproductive age	-	1,468,930
CBR	43	32.3
NRR	2.4	1.63
MAC	30.5	28.8
TFR	5.8	3.9
Urban	4.9	3.7
Rural	6.5	4
High-risk group		
15-19	84	76.2
45-49	101	37.4
Childlessness*		21
Urban	-	19.8
Rural	-	22.6

Executive summary

This report presents fertility estimates drawn from the 2022 Population and Housing Census (PHC) of Liberia. Through the analysis of fertility trends in the 2022 Liberia Population and Housing Census (LPHC), valuable insights into current fertility levels and differentials in Liberia are provided. Such data holds significance for evidence-based policymaking across sectors like education, social services and sexual reproductive health. Moreover, the report delves into the context of sexual reproductive health within the country, particularly in alignment with international development initiatives like Sustainable Development Goal 3 and FP2030. By offering data to monitor fertility dynamics in Liberia, the study facilitates the formulation of responsive policies aimed at harnessing the demographic dividend amidst the onset of fertility decline in Liberia. Key findings are outlined below:

- Evidence suggests a declining fertility trend in Liberia, with the estimated total fertility rate (TFR) decreasing from 7.1 children per woman in 1984 to 3.9 children per woman in 2022, albeit still not up to replacement levels (2.1).

- Disparities in fertility rates among population subgroups, evident in previous censuses such as in 2008, are diminishing.

- Adolescent fertility remains notably high in Liberia, with approximately 10 per cent of adolescents aged 12-19 already mothers, and about 32.3 per cent of 19-year-olds already bearing children. This trend is particularly pronounced among adolescents with lower educational attainment and school dropouts.

Evaluation of Data Quality and Methodology

The main data utilized for this study originates from the 2022 LPHC. The analysis employed a combination of methodologies (direct and indirect). Direct techniques encompassed the computation of percentages and rates. In contrast, indirect methods (P/F ratio, Arriaga, and relational Gompertz model) were utilized for fertility estimation. These approaches aimed to evaluate and rectify any discrepancies in current fertility data, particularly addressing issues like underreporting and the omission of births, which might otherwise have led to artificially low fertility indicators. The application of these indirect methods

suggests an average of 3 to 4 children per woman over her reproductive years.

Levels of Fertility and Differentials

The study also found a crude birth rate (CBR) of 32.2 births per 1,000 population for the preceding year of the census. Urban and rural areas observed a rate of 32 births per 1,000 each, while the rates ranged between 29.9 births and 35.4 births at the county level. The average number of daughters a woman of reproductive age would have during her lifetime if she passed through the prevailing age-specific fertility rates (ASFRs) without mortality is 1.92 for Liberia, and 1.8 and 2.0 for urban and rural areas, respectively. With the observed reproductive rates (GRR, NRR) greater than 1, the cohort of women was having enough daughters to replace themselves in the population. Further, the mean age at childbearing in Liberia is 28.8 years, with this rate being slightly higher in urban (29.2) compared to rural (28.2) areas.

The TFR for Liberia was estimated at 3.9, implying a woman will have an average of 3.9 children throughout her reproductive years if the prevailing ASFRs persist. Fertility rates were higher in rural areas (an average of four children) than urban areas (average of 3.7 children). The report also found a general decline in fertility trends over time, with the 2022 LPHC revealing a further reduction in fertility.

The results show literate women have fewer children (average of 3.8) compared to non-literate women (average of 4). Generally, an inverse relationship was observed between education and fertility; with high rates of fertility found among women with lower levels of education, particularly women with no formal education. Regarding fertility and marital status, the 2022 LPHC recorded the highest TFR among women in unions (Consensual – 4.5, Polygamous – 4.5 and monogamous – 4.4), with the lowest observed among never married women (3). Women in poorest, poorer and middle wealth quintile observed a TFR of 3.6 while women in the richer and richest quintile observed a fertility rate of three births. Among disabled people, fertility levels range from 4.5 children among women with disability in seeing, walking (4.3), remembering (3.9), albino (3.7), hearing (3.6), self-care (3.31) and 3.2 children among women with disability in communicating.

Fertility among high-risk groups (12-19 and 45+)

The report also shows that, on average, adolescents between the ages of 12 and 19 give birth at around 15 years. Approximately 2 per cent of adolescents had a live birth in less than 12 months to the census, and about 9.25 per cent of adolescents are already mothers. The report also shows that around 15 per cent of adolescents aged 15 to 19 were already mothers. Similarly, on average, 1 in every 10 seventeen-year-old, one in every five eighteen-year-olds, and about one in every three nineteen-year-old are adolescent mothers in Liberia.

The results indicate that about 15 per cent of adolescents are already mothers and their relative contribution to overall fertility among women of reproductive age in Liberia is nearly 10 per cent. Further, 21 per cent of rural adolescents were mothers compared to 11 per cent of urban adolescents, with a relative contribution of 12 and 8 per cent respectively to TFR in Liberia. Higher numbers of adolescent mothers (nearly 22 per cent) were reported among adolescents who are not literate, while lower numbers (12 per cent) were recorded for literate adolescents. For marital status, a little over 40 per cent of adolescents in marital unions (monogamous or polygamous) were mothers, while about a third of adolescents who were separated (36 per cent) or in consensual union (38.6) were mothers. The lowest number of adolescent mothers was observed among widowed (15.6 per cent) and never married (7.9 per cent) adolescents. Additionally, the percentage of adolescent mothers was at its lowest among those in the wealthiest (5.11 per cent) quintile, while approximately one in five adolescents in the poorest (19.63 per cent) quintile were mothers. With average parities, a similar linear association was observed, with 0.1 births among the richest and 0.3 births was observed among the poorest wealth groups.

Although at a different tempo, fertility still occurs a little late in Liberia among some population subgroups. Women aged 45-49 in Liberia had a birth rate of 37.4 per 1,000 women, a 0.94 per cent late fertility rate and a relative contribution of 4.9 per cent to Liberia's TFR. The age-specific fertility rate for women in rural areas was relatively high (38.4 per 1,000 women) compared to what was observed in urban areas (35.8 births per 1,000 women). Regarding literacy and fertility among women aged 45+, a birth rate of 33.3 births per 1,000 was observed among literate women compared to 39 births per 1,000 among non-literate women. There was not much difference between women aged 45+ with no formal education (38.5 births per 1,000) and women aged 45+ with primary education (36.7 births per 1,000 women). Women with secondary plus education on the other hand reported a relatively lower birth rate (31 births per 1,000 women). The average parties varied from 4.8 births among women in the poorest group to 3.7 births among women in the richest group. The relative contribution of women aged 45+ to TFR was about 5 per cent nationally. Among high-risk groups, there has been a decline in births among women 15-19 and 45-49 between 2008 and 2022 across Liberia.

Childlessness in Liberia

The report found a general decline in the level of childlessness across Liberia. Data from this present census shows that about one in every five women (21 per cent) aged 40-49 is childless. Childlessness was higher in rural areas (22.6 per cent) than urban ones (19.8 per cent). Childlessness varied across sociodemographic characteristics. About 24 per cent of women with no literacy skills were childless whiles 16.7 per cent of literate women were childless. A downward pattern of childlessness was observed (from 23.6 per cent to 16.7 per cent) as the level of education increased. High levels of childlessness were observed among women who are never married (31.2 per cent), the divorced (18.9 per cent) and women in polygamous unions (18.6 per cent). The least childlessness was observed among women in consensual unions (15.8 per cent). The least childlessness was observed among women in the middle wealth group whereas the most childlessness was observed among women in the richer wealth group, which was unexpected.

Among disabled persons, the highest level of childlessness was observed among women facing difficulties in communication (37.8 per cent), followed by those encountering challenges in self-care (36.3 per cent). Women experiencing difficulty walking (23 per cent), vision impairment (23.8 per cent), and albinism (23.9 per cent) reported low childlessness rates.

Policy Implications and Recommendations

The implications of medium fertility rates as well as early and delayed childbearing have far-reaching impacts; including accelerated population growth, adverse maternal and child health outcomes, and diminished levels of female education, empowerment and participation in the labour force. The rapid expansion of the population poses obstacles to attaining socioeconomic development, amplifying the

need for more resources to achieve inclusive goals such as poverty eradication, universal access to healthcare, education and other essential services.

The findings show a relatively high adolescent fertility in Liberia compared to other countries in the region. There is an urgent need to roll out a public advocacy and dissemination drive to stem the tide of early childbirth in Liberia. To achieve this goal, government should draw on the state news agency as well as private news outlets to disseminate information to the citizenry on the benefits of delayed childbirth. Government can also employ a mix of mechanisms such as community dialogues and meetings, meetings with traditional and religious leaders, competitions and debates, theatre including plays, poetry, story-telling and singing, mass media (rural radio, FM, TV, newspaper, etc.), as well as mobile voice messaging and social media platforms to communicate the benefits of delayed childbirth to the citizenry.

With nearly 10 per cent of adolescents having been in marital unions, early marriage poses implications for adolescents' education and raises concerns about potential human rights violations. The Government should prioritize and strengthen measures to discourage early marriage and childbirth, emphasizing the importance of continued education for adolescents. Some of the strategies that can be adopted in delaying or preventing child marriage include empowering girls with information, skills and support networks, providing economic support and incentives to girls and their families, educating and mobilizing parents and community members to end child marriage, enhancing girls' access to a high-quality education, and, encouraging supportive laws and policies prohibiting child marriage.

The study also found a moderately high prevalence rate of childbirth among women at older ages. Pregnancy and childbirth are risky for women who give birth in their later years. To address this situation, it is recommended that Government intensify public education to inform people of the risks of late childbirth. In addition, women should be provided with evidence-based information to support their procreation choices at older ages and minimize risks associated with pregnancy in old age.

Chapter 1: Introduction

1.1 Introduction

Fertility reflects the reproductive behaviour of a group of people (usually women) in a population. It serves as a critical component of population dynamics, representing a positive force responsible for the biological replacement and continuation of human populations.

Countries moved from a regime of high mortality and high fertility to a regime of low mortality and low fertility, a process called the demographic transition (DTT). Thus, high birth rates were thought to be crucial in traditional rural agrarian contexts to counteract high mortality. The fertility transition was, however, sparked by the move towards modernity, which was characterized by developments like industrialization, urbanization, better education, growing earnings and a decline in mortality. In a similar vein, the growing expenses of having children and the dwindling economic benefits they offered, such as labour and assistance during old age mostly caused the drop in desired family size. Thus, in order to accommodate shifting reproductive desires, there was a subsequent rise in the need for and use of birth control (Bongaarts and Hodgson, 2022; Caldwell, 2005).

As countries undergo development, there is an inverse relationship between fertility and development indicators in present-day societies. This transition varies widely from one population to the other, with many developed countries exhibiting low fertility rates, whereas sub-Saharan Africa, marked by lower levels of development, experiences higher fertility levels (Bongaarts and Casterline, 2013).

The variability in fertility levels shapes the age composition of populations, a factor influenced by diverse elements such as country-specific conditions, social dynamics, economic landscapes, political contexts and individual characteristics. Projections by the United Nations suggest a global convergence toward replacement fertility (2.1) by the year 2050 (UNDESA, 2022b). Despite this, approximately half of the world's population resides in regions characterized by fertility rates below replacement levels, encompassing areas such as Europe, North America and parts of East Asia, while sub-Saharan Africa surpasses this threshold.

The challenges associated with both low and high fertility are reflective of each other (Morgan, 2003). The nuanced interplay of fertility with population dynamics underscores its significance in policy considerations for governments and policymakers. Some countries actively implement pro-natal measures, including financial incentives, to boost the natural birth rate. Conversely, others adopt policies aimed at curbing rapid population growth, while some focus on maintaining current fertility levels for the sustainable welfare of future generations.

Significant reductions in population size can lead to population ageing, introducing unprecedented challenges for political and social institutions constructed within a growth-oriented economic paradigm (Cai, 2010; Ogura and Jakovljevic, 2023). Simultaneously, concerns persist in regions marked by high fertility levels, where governments advocate for smaller family sizes. This underscores the pivotal role fertility plays in the ongoing relevance of political and economic structures.

Data for fertility estimation ideally comes from three main sources, the vital registration system (VRS), sample surveys and censuses. The VRS collects routine vital events and birth history of women within a defined geographical space. Sample surveys collect information on current, past and cumulative fertility of a population usually between 15 and 49 years over a pre-defined period of time e.g. the Demographic and Health Survey (DHS). Censuses, as a result of their complexity and wanting to enumerate every person, collect summary information on the fertility experience of all women aged 12 to 49 years.

Challenges persist with the VRS and sample surveys in developing countries; where the former is largely incomplete while the latter does not cover the entire population. The census has several advantages as a means of collecting information on the fertility of the population, given its size, as it reduces random errors associated with sampling as well as being able to be used for subnational analysis (Hill, Johnson, Singh, Amuzu-Pharin, and Kharki, 2018). Additionally, census data serves as a fundamental basis for the current population estimate as well as future projections (UNDESA, 2017).

1.2 Background of 2022 Liberia Population and Housing Census

For the 2022 Liberia Population and Housing Census (LPHC), household to household canvassing was used to enumerate all persons within the borders of Liberia on the census night and records made as per the questionnaire in the administrative report. Vagrants, travellers and institutional populations were enumerated on the census night (midnight of 11 November, 2022). Census data collection was carried out from 12th November to 20th December 2022.

The 2022 LPHC collected data at individual, household and institutional levels. The types of data collected were diverse and included sex, age, marital status, ethnicity/nationality, religion, place of birth, previous residence, literacy and educational attainment, labour force participation, disability status, fertility and mortality.

This report focuses on the analysis of data collected on fertility cross-classified with some of the aforementioned characteristics. All women aged 12 through 54 years were asked questions regarding the number of children they had borne alive in their lifetime and whether the children were living in the household, living elsewhere or were dead. In addition, women aged between 12 and 49 years were probed on the sex of the most recent birth in the last 12 months, in what month and year the child was born.

The insights derived from the examination of fertility patterns in the 2022 LPHC will serve as valuable data, offering evidence on the present status of fertility levels and variations. This information is crucial for shaping evidence-based policies related to education, social services and sexual reproductive health within Liberia's population. It aligns with the broader goal of achieving initiatives aimed at moderating fertility, including FP2030 and the United Nations Sustainable Development Goals (SDGs). This strategic alignment contributes to Liberia's overarching development agenda and facilitates the harnessing of its demographic dividend.

1.3 Importance of fertility thematic report

Fertility along with migration and mortality stands as one of the pivotal components shaping population dynamics, significantly influencing a country's size and structure. It not only dictates the essential needs of the population but also guides governmental investments in crucial sectors such as education and health. The repercussions of fertility extend to the health of both children and mothers, hindering human capital investment and impeding economic growth. High fertility rates, especially among young mothers, carry adverse implications for maternal health and child survival (Amir-ud-Din, Naz, Rubi, Usman, and Ghimire, 2021; Chatterjee and Sennott, 2021; Stover and Winfrey, 2017). In the context of Liberia, where challenges arise from elevated fertility in a relatively small population, this analysis emphasizes the exploration of fertility levels, trends and accomplishments tied to key policies. The goal is to foster a comprehensive engagement of stakeholders, both national and international, to formulate specific recommendations. National frameworks like the Costed Implementation Plan and FP2030, along with global initiatives like the International Conference on Population and Development, Addis Ababa Declaration on Population and Development (AADPD+5) (ECA, AU, and UNFPA, 2013), African Union Agenda 2063 (Moono, 2021) and SDGs (United Nations, 2023), most of which have been crucial in shaping policies and programmes related to sexual and productive health and improving the overall well-being of the population, a prerequisite for building resilient societies capable of long term-economic growth and sustainable development. Monitoring SDG progress involves 27 indicators, 16 of which directly relate to health status. This study not only underscores the importance of aligning government initiatives with fertility goals but also provides insights into specific subgroups of the population with high fertility, aiding targeted interventions at addressing the needs of the population.

In contrast to traditional sample surveys, the census holds significance as it furnishes comprehensive national data on essential variables crucial for monitoring government initiatives and national programmes. More specifically, the census facilitates the examination of variations across the nation, assessing the impact of government programmes on health and fertility levels at the smallest administrative units. This enables an accurate evaluation of cause-and-effect relationships (United Nations DESA, 2017).

1.4 Demographic, economic and social context

The past and present fertility rates in Liberia have been shaped by a confluence of factors encompassing both cultural norms and the evolving global dynamics including improved economic policies, educational pursuits, modernization, urbanization, healthcare and access to contraception.

Sub-Saharan Africa exhibits a pronounced inclination towards large family sizes, early marriage and heightened adolescent fertility, a trend that, despite progress in fertility reduction, persists to the present day, with Liberia being no exception (Kollehlon, 1989). The region's elevated population growth results from historical context of high child mortality, low level of female education and status, early age at marriage, low contraceptive use, high fatalistic attitude "up to God", economic advantages associated with large family sizes (Caldwell and Caldwell, 1987; Saydee, 1992) significantly shape Liberia's fertility landscape.

Additionally, ethnicity plays a role in shaping women's fertility behaviour through group pressure and social support dynamics (Wildeman, Smits, and Schrijner, 2023). The gradual decline in fertility in Liberia mirrors broader patterns observed across sub-Saharan Africa, attributed to slow progress in family planning (FP) programmes, persistent preferences for large family sizes, disruptions in female education, and a gradual increase in the age at first marriage (Kebede, Goujon, and Lutz, 2019).

1.4.1 Socioeconomic context

Population growth fell from 3.4 per cent in the 1980s to 2.1percent per annum between 1984 to 2008. The decline was attributed to the effects of the civil conflicts between 1989 to 2003 associated with high mortality and emigration to other countries (GoL, 2005). Moreover, with the restoration of peace, security and political stability in 2003 and successful democratic, free and fair elections over the years and improvements in health and social and economic environment, the Liberians that fled and sought refuge in other countries continued to return, impacting on the population growth rate of 3.0 per cent per annum between 2008 to 2022.

Liberia's population, is currently at about 5.2 million (LISGIS, 2022), is predominantly youthful, with 3.03 million of her population below the age of 25. Comprising 15 counties, Liberia operates as a low-middle-income nation, primarily driven by exports in iron-ore and rubber, alongside growth in construction and services. Despite this economic activity, 60 per cent of Liberians live below the national poverty line of $3.65 a day (OPHI, 2022).

1.4.2 Health context

The protracted civil conflict, primarily spanning from 1989 to 2003 and the Ebola disease outbreak in 2014, severely disrupted critical infrastructures leading to limited access to education and health services (Challoner and Forget, 2011; Fall, 2019). This may have contributed to elevated rates of infant and maternal mortality, undesired adolescent pregnancies with associated complications, and heightened fertility (United Nations 2007). Indicators such as under-five mortality (93 per 1,000), a fundamental measure of population health, and maternal mortality (742 per 100,000), reflecting the safety of pregnancy and childbirth as well as the effectiveness of the health system, rank Liberia among the highest in West Africa (LISGIS et al., 2019)

Presently, Liberia maintains a health facility density of 2.1 per 10,000 population, meeting the World Health Organization (WHO)'s minimum requirement of two facilities per 10,000. However, health worker density is at 12.8 per 10,000, falling short of the WHO's recommended 44.5 health workers per 10,000 population for achieving universal health coverage (WHO, 2022).

Advancements toward universal health coverage hinge on the availability, accessibility and quality of the health workforce. While there have been strides in increasing the supply of health workers, issues of mal-distribution and shortages persist in Liberia. Relative to the proportion of health workers, geographical distances to health facilities pose a significant barrier to accessibility for many rural populations. Health access is disproportionately skewed, favouring those living in urban areas over rural areas (Ross et al., 2023).

Given the widespread poverty, affordability becomes a pivotal factor determining health service utilization, particularly as many rural populations face limitations in accessing basic health services(Kentoffio et al., 2016; Kruk, Rockers, Tornorlah Varpilah, and MacAuley, 2011). Moreover, despite the elimination of user fees for maternal healthcare in public health facilities through the Ministry of Health's Basic Package of Health and Social Welfare Services in 2008, such fees have reemerged informally as a form of out-of-pocket payment at the point of service, especially affecting vulnerable populations such as pregnant individuals where healthcare is a necessity (Karmbor-Ballah et al., 2019).

1.4.3 Social context

The persistent high fertility and high population growth rates in the recent past in Liberia encouraged the adoption of policy and strategies to exert

influence and regulate the patterns on fertility. Hence, the establishment of the Family Planning Association, now the Planned Parenthood Association in 1956 and enactment of the FP law in 1976 which provided the foundation to impact fertility. The first National Socioeconomic Development Plan, 1976-1980 gave emphasis on preventive health, Maternal- Child Health and Family Planning programme (MCH/FP). These efforts were consolidated within the Second Socioeconomic Development Plan of 1981-1986.

In addition, cognizant of the adverse effect of high fertility levels on socioeconomic development, the Government of Liberia established the National Population Commission and adopted the National Policy on Population for Social and Economic Development and the post conflict National Health Policy and Plan (2011–2021) which was aligned with the Liberia's reproductive, maternal, neonatal, child, and adolescents health (RMNCAH) as well as the Investment Plan for Building a Resilient Health System (2015–2021); the National Sexual, Reproductive, Maternal, Neonatal, Child and Adolescent Health (SRMNCAH) Policy and Plan has to some extent strengthened and made the health system for national development resilient. The broad goal of these initiatives was to reduce morbidity and mortality attributed to sexual reproductive conditions and ensure all have access to quality, accessible and affordable FP services and improve the quality of life of the people.

A major component of the policy was to improve the status of women through forging high proportion of female formal education, which would increase the age at marriage and provide opportunities for females to control their reproductive behaviour.

These efforts have to a large extent led to an increase in the use of FP services in the country. It has been observed that the use of FP methods has generally increased, albeit gradually. For example, the contraceptive use among currently married women increased from 6.4 per cent in 1986 to 10 per cent in 1999/2000, 11.4 per cent in 2007 (LISGIS et. al. 2008). Moreover, contraceptive use increased from 19 per cent in 2013 to 24 per cent in 2019-20 (LISGIS, 2013 2020). Although contraceptive use is still low, its incorporation into reproductive practices is leading to a decline in fertility rates (Bolarinwa, Afaya, Ajayi, Ojo, and Alawode, 2022).

In addition, the National Free Compulsory Education and the Poverty Reduction Strategy and The Pro-poor Agenda for Prosperity and Development within the Liberia Vision 2030 framework are leading to

increased enrolment in school attendance over the years. For example, male school attendance increased from 31.8 per cent in 1984 to 55.5 per cent in 2008 while female proportion rose from 19.1 per cent in 1984 to 53.7 per cent in 2008 and 49.5 per cent out of 14,524 total enrolment in the 2019/2020 academic year (Ministry of Education, 2021). This may probably exert a downward impact on fertility.

Following these initiatives, coupled with various contributing factors, a decline in fertility has been observed from 6.7 children in 1986 to 4.2 children in 2016, as reported by LISGIS (2016). While substantial strides have been achieved in reducing fertility, the pattern of decline is not uniformly distributed across diverse social characteristics and geographic locations in Liberia.

Committed to the FP2020 vision, the GoL subsequently came with the Costed Implementation Plan (CIP) in 2017 to translate its international commitments into national goals with an overarching aim of increasing modern contraceptive prevalence (mCPR) from 30.7 per cent in 2016 to 39.7 per cent in 2022 among females of reproductive age (HP+, 2019). By doing so unwanted births will be reduced particularly among adolescents as well as maternal deaths.

Since its implementation, there have not been improvements in fertility reduction. Total fertility rate (TFR) remained at 4.2 in 2019 while mCPR dropped to 25.3 per cent in 2019 (LISGIS et al., 2019). These can have implications on reaching the international commitments such as the SDGs, specifically SDG 3.7 and SDG 5, which are focused on ensuring universal access to sexual reproductive services and empowering women and girls.

Examining the 2022 PHC fertility trends and patterns, the outcomes will offer evidence-based insights essential for formulating policies on sexual reproductive health at both national and sub-regional levels. Addressing these challenges and aligning policies with the SDGs can have a profound impact on future population trends, steering Liberia towards a lower population growth rate and improved reproductive health outcomes.

1.5 Objectives

It is important to understand the levels, trends and patterns of fertility in Liberia as research has shown that declines in fertility come about as a result of the right policies. The main objective of this report is to

determine the levels, patterns and trends of fertility in Liberia using the 2022 census as the primary source of data. The specific objectives are as follow:

• Analyse the level and trends of fertility;

• Determine fertility differentials by residence and other social characteristics; and

• Suggest policy recommendations.

1.6 Structure of the report

In view of the objectives, this report is presented in six chapters. Chapter 1 gives the background to the report. Chapter 2 evaluates the data and methods used to measure fertility levels. Fertility differentials and trends are explored in Chapter 3. Chapter 4 explores fertility among high-risk age groups. Chapter 5 explores childlessness in Liberia. Chapter 6 summarizes the report by discussing the policy and programme implications of the findings as well as making recommendations for policy considerations.

Chapter 2: Evaluation of data quality and methodology

2.1 Sources of data

The chapter provides definitions for the terms utilized in this report, outlines the sources and details the methods employed to assess the quality of fertility data. Additionally, it delineates the methodologies used to estimate fertility in Liberia for the 2022 Population and Housing Census (PHC). The data utilized for fertility estimation in this report was extracted from the fertility section (questions P31A-P40) of the 2022 LPHC questionnaire, focusing on questions related to children ever born (CEB) (questions P31A-P35), and recent births in the last 12 months (questions P36-P39).

2.2 Definition of terms

Number of live births: Counts of births that occurred within the last 12 months

Crude birth rate (CBR): is defined as the number of births in a given year divided by the midyear population in the same given year.

General fertility rate (GFR): is the ratio of births to 1,000 women of reproductive ages. Thus, the number of live births by number of women in reproductive age (usually 15–49 years) in a population over a specified period of time.

Age-specific fertility rates (ASFR): is the annual number of live births to women in a given age (usually five-year age cohort 15-19, 20-24,) group per 1,000 women in the same age group.

Total fertility rate (TFR): is the average number of children a woman will have in her reproductive lifetime with the prevailing age-specific fertility rates (ASFRs) observed in a given year, assuming no woman died in her childbearing years. The TFR is mostly used when discussing a population's fertility performance. It is also used as the rate required for a country to maintain its current population, not taking into consideration other potential factors such as migration. The TFR will be used as the measure of fertility in this thematic report.

Gross reproduction rate (GRR): The average number of daughters a woman would have if she experienced the prevailing fertility rates without taking into account mortality over the period of consideration. It also shows the extent to which a generation of daughters will replace the preceding generation of females if fertility remains constant.

Net reproduction rate (NRR): is a measure of the number of daughters a cohort of newborn girl babies will have during their lifetime assuming a fixed schedule of ASFR and mortality rates. Thus, this index measures the extent to which a cohort of newly born girls will replace themselves under a given fertility and mortality schedule. It has been used to measure a population's ability to replace itself.

CEB and average parity: the number of children born alive to a woman while average parity refers to number of children born alive per woman by age group.

Mean age at childbearing (MAC): This is the mean age of mothers at birth of their children if women of reproductive ages were subject through their lives to the prevailing ASFRs of a given year.

Late fertility rate (LFR): The per cent of women aged 45-49 who gave birth during the last 12 months of the census.

These terms or measures are essential demographic indicators for policymakers, health professionals and researchers. It helps researchers to assess the reproductive behaviour of a population, in tracking fertility levels, patterns and trends over time, which can be used to inform FP, healthcare and other social policies.

2.3 Types of data collected

This report primarily concentrates on the analysis of fertility-related data, cross-referenced with some of the characteristics already mentioned. All women between the ages of 12 and 54 were queried about the number of children they had given birth to

during their lifetime, as well as the children's current residence status (whether they resided in the same household, elsewhere, or had deceased). Furthermore, women aged 12 to 49 were specifically asked about the gender of their most recent child born in the past 12 months, along with the specific month and year of the child's birth. A 'live birth' was defined as a child displaying any signs of life (breathing, crying, movement of limb, pulsation of umbilical cord) at the time of birth. This distinction was made to prevent the inclusion of stillbirths and late fetal deaths among infants who were not born alive. This measure aimed to address issues such as potential overreporting of live births by younger women, underreporting by older women, age-related inaccuracies and event dating errors. Responses were recorded exactly as provided by the respondents.

2.4 Data evaluation

Determining accurate demographic data in Liberia and other sub-Saharan African regions is a complex challenge, marred by various administrative and logistical issues. These challenges result in both coverage and content errors, which vary in nature and extent across different countries and regions. Coverage errors manifest as certain segments of the population being omitted from data collection, while content errors relate to misreporting or misclassification of events, such as births. These errors introduce biases and distortions into estimates derived from such data.

In this section, the report specifically focuses on content errors within the reports provided by women of reproductive age (15-49 years). The discussion revolves around factors that have the potential to skew fertility estimates derived from this data. Fertility estimates in this report rely on data related to both lifetime and current fertility (live births).

The age and sex composition of the population are critical factors in understanding fertility levels, trends and patterns. As a result, the quality of age data is primarily assessed by examining the extent of age misreporting by women of reproductive age. Additionally, analysing average parities, parity distributions, and the proportion of women who remain childless provides further insights into the accuracy of fertility data reporting for different age cohorts. It is important to note that editing rules, especially regarding the treatment of women whose reported parity is considered unusually high for their age, may change from one census to another.

The assessment of age data accuracy involves scrutinizing various indicators of data quality, given that age misreporting is a prevalent issue in censuses and sample surveys, particularly in developing countries. This misreporting is influenced by multiple factors and, in turn, both reflect and affect various social and economic variables. Accurate knowledge of the population's age distribution is crucial for effective social and economic planning. Therefore, a thorough evaluation of the reported ages of women of reproductive age is essential.

Age constitutes one of the important variables in demographic analysis, as emphasized by Randall and Coast in 2015. Misreporting and heaping of a woman's age can significantly impact fertility estimates. The credibility of ASFRs and TFRs, particularly when utilizing the Brass-type questions, hinges upon the accuracy of reported births within the 12 months preceding the census and the cumulative number of CEB to women of reproductive age. It is important to note that the accuracy of these reported data is contingent on the quality of the ages reported for women of reproductive age.

In this section, the report assesses the quality of age data reporting among women aged 15 to 49 years. The primary outcome variable examined is age heaping or digit preference, measured using the Whipple and Myers blended index for populations aged 18-47 and 20-49, respectively. Age heaping or digit preference refers to respondents inaccurately reporting their ages or dates of birth, often demonstrating a preference for ages that end in "0 or 5".

2.4.1 Classification of Whipple's and Myers indices

The evaluation follows the general interpretation of the Whipple's and Myers indices of data quality. A Whipple index of 100 represents no preference for ages ending in 0 and 5. The index summary is classified into five categories, highly accurate (<100), fairly accurate (105-109.9), approximate (110-124.9), rough (125-174.9) and very rough (>175). The Myers index summary is classified into three categories, low (<10), moderate (10-20) and high (>20) for values greater than 20.

2.4.2 Age heaping

Figure 2.1 and Figure 2.2 show the distribution of Liberian women of reproductive age in single years. From a visual assessment in Error! Reference source

not found., there is a preference for ages that end with digits 0 and 2 shown in the spikes and dips, an observation contrary to the familiar feature of 0 and 5 in sub-Saharan African population census data. For example, among women of reproductive age, the population enumerated at age 22 is twice the population aged 21. Similar observations are made for populations aged 32 and 42, Figure 2.2

shows preference for or heaping on terminal digits 0 and 2 and also a gross underreporting of digit 1. This observation may be as a result of investigators converting ages into year of birth, and subsequently turning them into ages resulting in the reduction of a year from some ages of the population (Pison and Ohadike, 2006)

Figure 2.1. Distribution of women of reproductive age in single years

Terminal Age Reporting (Women 15 - 49)
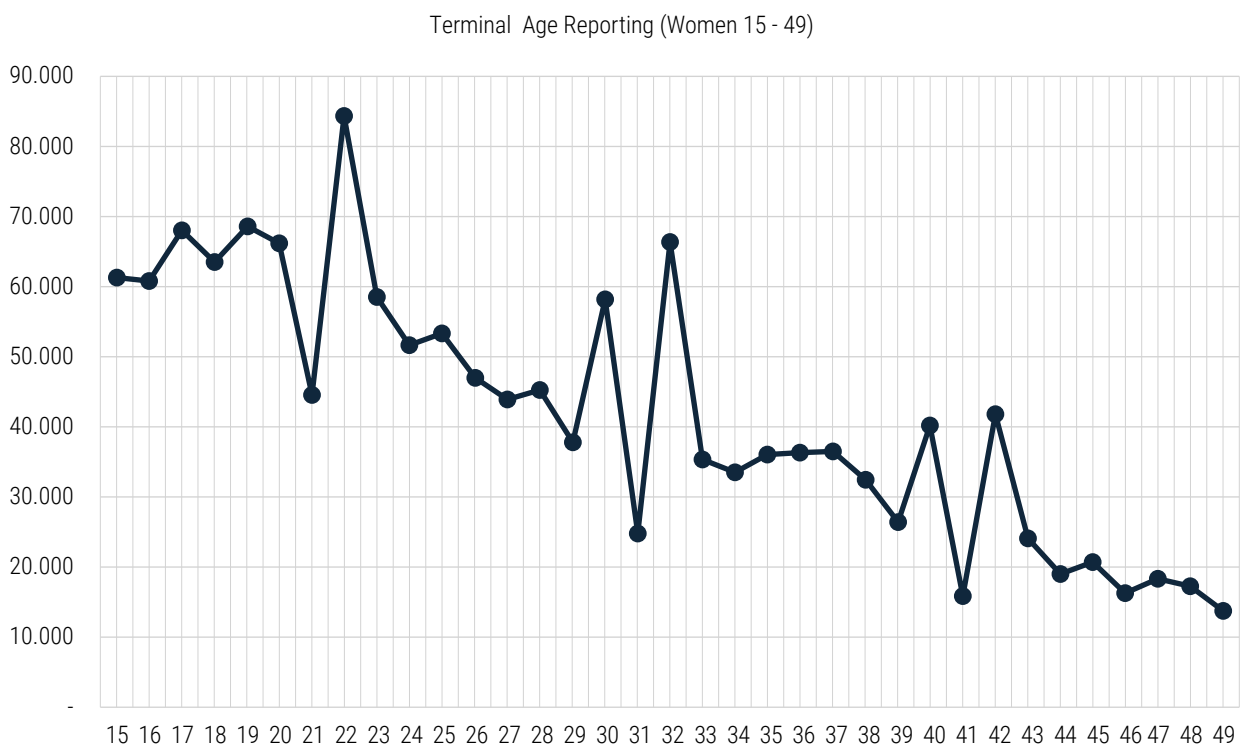
Figure 2.2. Preference for terminal age digital reporting

FEMALE
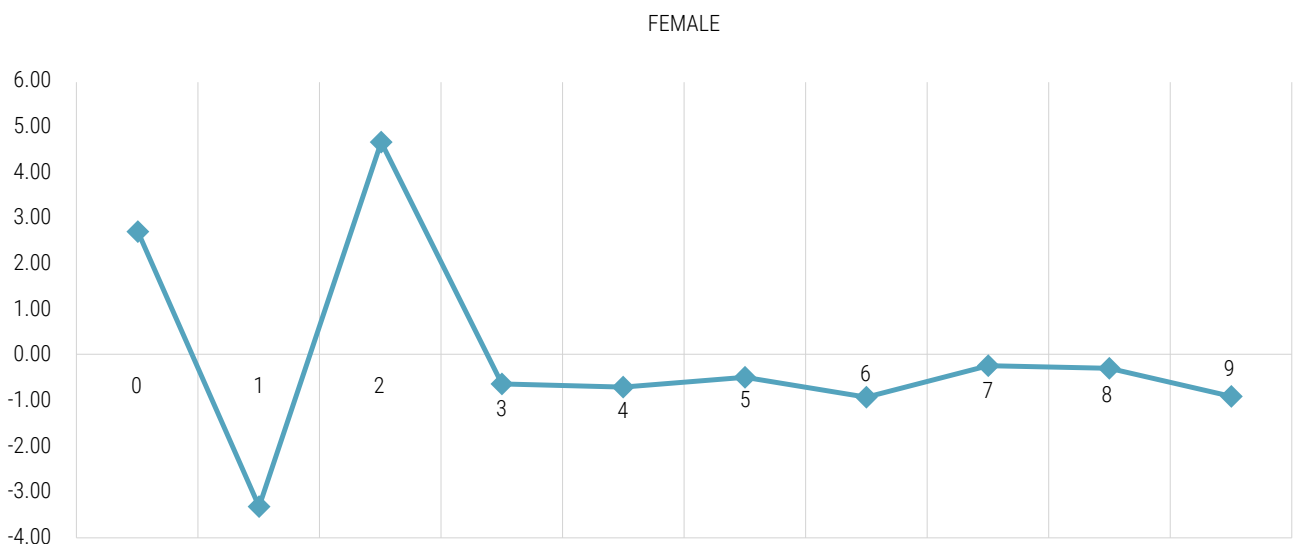
Table 2.1 presents the results from the age quality assessment for the women of reproductive ages across counties in Liberia. From the assessment, the data is considered to be of good quality and the age reporting was approximate for the population. The value of Whipple's and Myers indices is about 110 and 8.6 respectively indicating that the data can be considered approximate and the misreporting of ages is low. The digit preference is not a new phenomenon in Liberia's data, though contrary to what was observed in previous censuses. Saydee (1992) observed that in 1984 and 2008 the Myers' index for females was 26.9 and 20.2 respectively, the 8.65 observed here is however an improvement. This improvement may be as a result of better data collection strategies such as CAPI as well as administering survey to an increasing literate population, implying age heaping is a mutable problem. The R package DemoTools was used to estimate the Whipple's, Myers and Bachi index (Riffe et al., 2019).

Table 2.1: Data quality assessment by county of residence

County	Whipple	Myers	Bachi
Liberia	110.22	8.65	8.04
Bomi	116.03	10.61	9.90
Bong	108.97	9.87	9.24
Gbarpolu	117.28	11.97	11.10
Grand Bassa	103.47	8.55	7.87
Grand Cape Mount	122.53	12.87	11.91
Grand Gedeh	105.11	9.42	8.93
Grand Kru	97.23	7.91	7.46
Lofa	153.27	18.07	16.70
Margibi	104.60	8.81	8.23
Maryland	103.56	6.74	6.40
Montserrado	106.58	7.86	7.10
Nimba	106.34	7.27	6.76
River Cess	108.20	7.54	7.35
River Gee	99.26	7.66	7.18
Sinoe	104.08	8.86	8.50

Disaggregating the data quality by county of residence, the quality of data portrayed a different pattern, The Whipple index was highly accurate for Grand Bassa, Grand Kru, Sinoe. Counties Bong, Grand Gedeh, Margibi, Montserrado, Nimba and River Cess were fairly accurate. Age reporting from Bomi, Grand Cape Mount and Gbarpolu were approximate. However, the age reporting in Lofa County was rough and as such one should proceed with caution.

2.5 Adjustment of age data

The age distribution of women aged 15-49, depicted in Error! Reference source not found. and Figure 2.2, reveals a notable inclination towards ages ending in the digit 2. To address issues of data heaping and digit preference in age reporting, Swanson and Seigel (2004) propose corrective measures, thus the application of five-year moving averages to smoothen the age distribution. This smoothening technique, was applied using the Strong and Arriaga methods through the population analysis spreadsheet software AGESMTH, is presented in Figure 2.3. The results indicate that the smoothening process effectively

mitigated the problems associated with age heaping, eliminating erratic fluctuations in reported numbers.

Upon examining the reported and smoothed age distributions from the Liberia 2022 PHC, using the Strong and Arriaga methods, minimal disparities were observed. However, a closer analysis revealed overreporting in ages 15-24 and underreporting in ages 25-29. In contrast, ages 30-49 exhibited consistent patterns between the reported and smoothed data. This report, in alignment with Whipple's and Myers indices (Table 2.1), affirms the overall accuracy of the age data, substantiating its suitability for subsequent analyses.

Figure 2.3. Reported and smoothed distribution of age
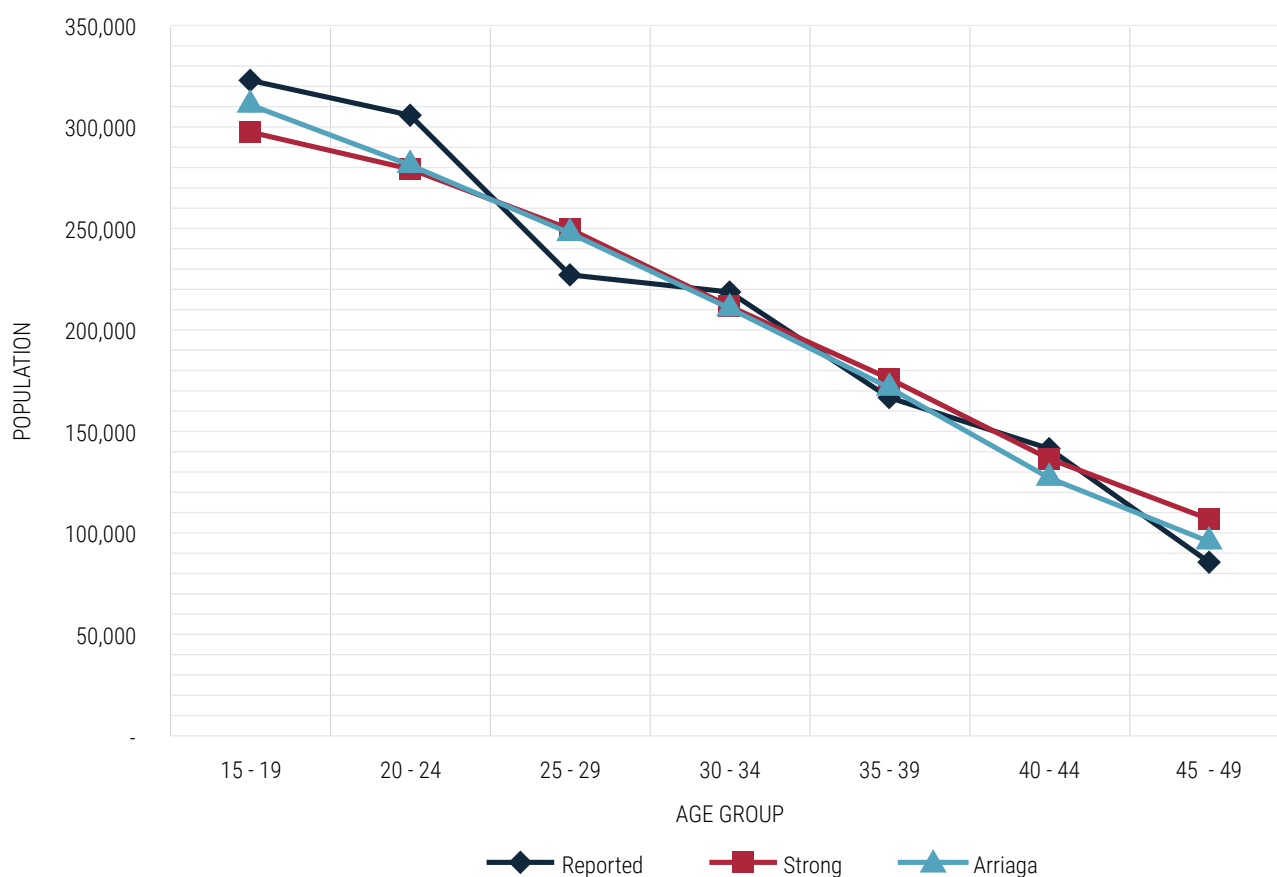
2.6 Pattern of average parities

A method to evaluate the reliability of reported data on CEB is to analyse mean parities, which are anticipated to rise with age if the data quality is high. In general, the number of children born to women tends to increase with age, and the number of children born to women at the conclusion of their

reproductive years serves as a gauge of completed fertility. As depicted in Figure 2.4, there is a consistent pattern of an increase in the number of children as age of the women advances, observed in both rural and urban areas. Additionally, the figure illustrates that, on average, rural women have a higher number of CEB compared to urban women. The observed average parities align with the expected trend.

Figure 2.4. Average parities by age group and type of place of residence
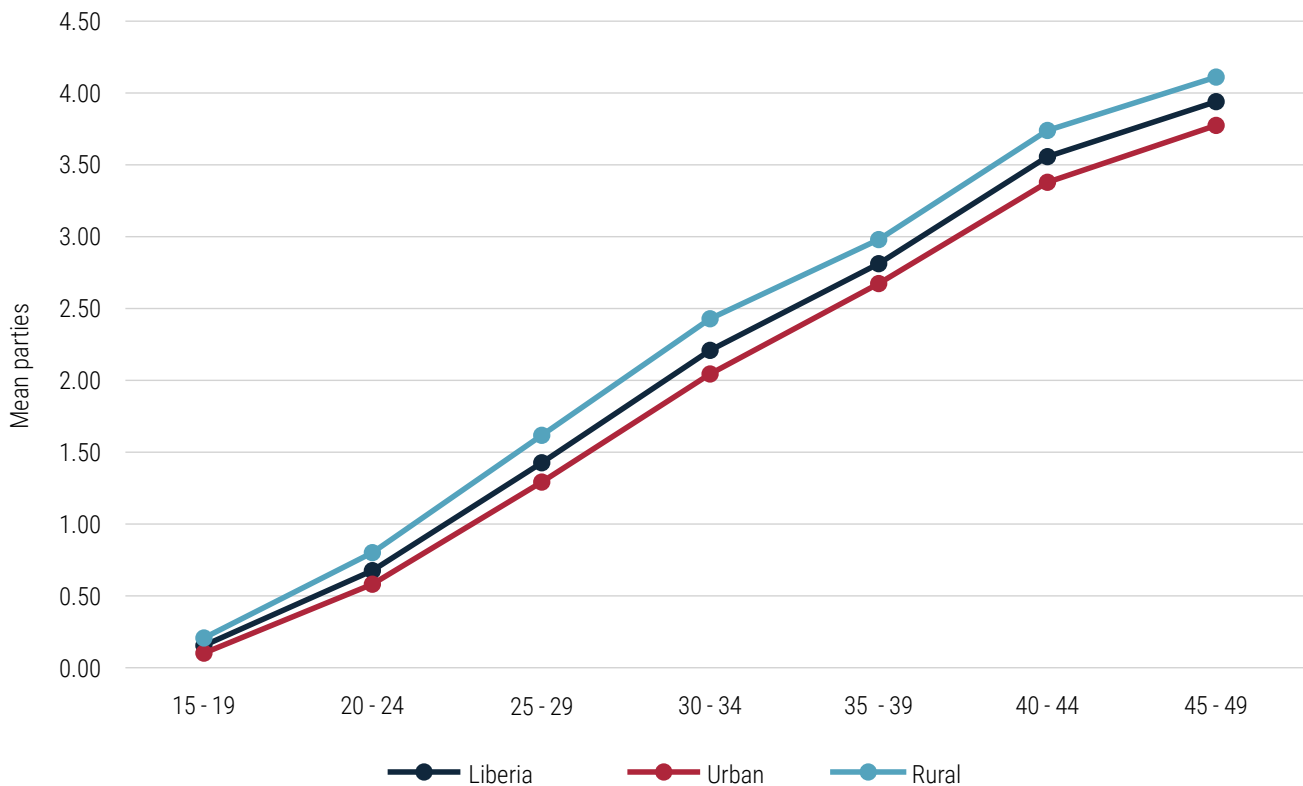
2.7 Methods of fertility estimation

Ideally, fertility estimates should be derived from a well-established VRS, utilizing conventional indices. However, in the Liberian context, the civil registration and vital statistics system are substantially incomplete. Consequently, indirect methods were employed to estimate fertility based on the LPHC. Two categories of questions addressing fertility were posed to women aged 12 and above: (i) current fertility, indicating the number of births to women in the 12 months preceding the commencement of census enumeration, and (ii) retrospective fertility, denoting the overall number of children born to the women. The tabulation of these variables utilized the Brass-type methods (P/F ratio, Arriaga and relational Gompertz model) of fertility estimation. The underlying principle of these indirect methods involves adjusting the current fertility to align with the fertility level suggested by a cohort of women.

2.7.1 Brass P/F ratio

The P/F ratio method modifies the age-specific fertility pattern by incorporating data on parity (number of children born) of a woman and the number of births in the last 12 months prior to a census. This adjustment aligns the observed fertility level, believed to reflect the actual age pattern of fertility, with the level of fertility indicated by average parities of women in reproductive age groups. It operates on the assumption that there is uniformity in age-specific fertility rate across all age groups, there is completeness of data assuming that the reporting of mean number of CEB is complete up to age 30 or 35, and thirdly, it assumes an absence of age misreporting. The Trussell-Coale variant relaxes the assumption of constant fertility proposed by Brass. In this method, ratios of average CEB (P) to fertility rates (F) are computed by age group and adjusted by ratios of corresponding age groups of younger women.

Table 2.2. Brass Trussel P/F ratio technique of estimating fertility

Age	CEB P(i)	Reported ASFR	Cumulative fertility Phi(i)	F(i)	P/F ratio	P2/F2	P3/F3	P4/F4	Average (P3/F3, P4/F4)
15-19	0.148	0.031	0.16	0.07	2.07	0.08	0.08	0.09	0.087
20-24	0.675	0.055	0.43	0.32	2.14	0.12	0.13	0.14	0.136
25-29	1.424	0.059	0.73	0.61	2.33	0.13	0.14	0.15	0.143
30-34	2.214	0.051	0.98	0.88	2.52	0.11	0.12	0.13	0.122
35-39	2.816	0.045	1.21	1.12	2.51	0.09	0.10	0.11	0.106
40-44	3.557	0.024	1.33	1.28	2.79	0.05	0.05	0.06	0.053
45-49	3.939	0.009	1.37	1.36	2.90	0.02	0.02	0.02	0.018
TFR		1.37				2.93	3.20	3.45	3.32

2.7.2 Arriaga method

Unlike the Brass P/F ratio method and its assumption, the Arriaga method which is a derivative of the P/F ratio conversely does not assume constancy in fertility rates, on the assumptions of completeness of reporting of births that are used to estimate ASFR is the same in all age groups, the reporting of average parities per woman is compete under the age of 30 or 35. This modification makes a provision of changing fertility levels by using a linear interpolation of CEB by age of the mother from two or more censuses (Arriaga, 1983). The Arriaga method requires two censuses, however, in the case of only one census being available, it can be assumed that the average number of children born per woman by age of mother has been constant. This was calculated through its extension included in FERTPF procedure in the MORTPAK application (United Nations).

Table 2.3. Arriaga method of estimating fertility - LPHC 2022

Age	CEB	Reported ASFR	Adjusted ASFR	Adjustment Factor
15-19	0.148	0.031	0.076	2.13
20-24	0.675	0.055	0.128	2.23
25-29	1.424	0.059	0.164	2.44
30-34	2.214	0.051	0.137	2.51
35-39	2.816	0.045	0.126	2.58
40-44	3.557	0.024	0.103	2.75
45-49	3.939	0.009	0.037	2.82
TFR		1.37	3.85	

2.7.3 Relational Gompertz

The relational Gompertz model is a refinement of the Brass P/F ratio that estimates age-specific and total fertility from the shape of the fertility schedule based on data from recent births reported in censuses and surveys while determining its level from average parities of younger women (Moultrie, Dorrington, Alan, and Hill, 2013). It operates on the principle that ASFRs may be inaccurately reported in census

data due to various factors like age misreporting and underreporting of births. The Gompertz model attempts to estimate the true fertility rates by comparing the reported age-specific fertility rates and average parities of women, thus the ASFR provides the shape of the distribution while the average parities provide the corrected ASFR and TFR. It also does not require the assumption of constant fertility. This method was used to estimate TFR using the population analysis spreadsheet "REL-GMPZ" developed by the US Census Bureau for demographic analysis.

Table 2.4. Relational Gompertz method of estimating fertility - LPHC

Age	CEB	Reported ASFR	Based on CEB only		Based on ASFR and CEB	
			2+2 points	3+3 points	2+2 points	3+3 points
15-19	0.148	0.031	3.48	3.69	2.59	2.38
20-24	0.675	0.055	3.30	3.96	2.89	2.93
25-29	1.424	0.059	3.41	4.09	3.19	3.31
30-34	2.214	0.051	3.52	4.07	3.41	3.54
35-39	2.816	0.045	3.47	3.81	3.42	3.52
40-44	3.557	0.024	3.76	3.92	3.75	3.80
45-49	3.939	0.009	3.96	3.99	3.96	3.97
TFR		1.37	3.56	3.93	3.32	3.35

2.7.4 Comparison of estimation methods

Table 2.2,Table 2.3 and Table 2.4 , present estimates obtained through the three proposed methods for estimating fertility using indirect approaches. The TFR was 1.37 with the direct approach (reported births in the last 12 months), 3.32 with the P3/F3 and P4/F4 average of the P/F ratio method, 3.85 with the Arriaga method, and 3.35 using the relational Gompertz method. The application of these indirect methods suggests an average of 3 to 4 children per woman over her reproductive years. Despite the variations in the methods used, the estimates point to a decreasing fertility in Liberia since 2008 when TFR was 6.1.

From the analysis based on the three indirect methods applied for the adjustment of the reported TFR, the Arriaga model's estimate of 3.85 appears to be the most plausible reflection of the current fertility levels in Liberia based on various considerations. The DHS conducted in 2019 reported a TFR of 4.2 for Liberia, while the Malaria Indicator Survey in 2022 recorded a TFR of 3.8. Furthermore, the United Nations World Population Prospects estimated Liberia's fertility at 4.09 in 2021. These sources, particularly the DHS surveys, are globally recognized and represent the most extensive dataset on fertility in low- and middle-income countries. Given the Arriaga model's closeness to these reliable estimates and its alignment with the demographic trends observed in the recent past in Liberia, it is to be concluded to reflect the reality of fertility dynamics in Liberia during the 2022 census period. The comparatively lower estimates from the Brass P/F and relational Gompertz models diverge from these established benchmarks. Consequently, the TFR for Liberia is approximately 3.9.

2.8 Data limitations

The exploration of fertility by economic activity (occupation and industry) of woman was hindered by data processing issues arising from challenges in the data collection process. These encompassed discrepancies in recorded values attributed to errors during data collection or misalignment in the data collection software, rendering information gleaned unreliable for meaningful analysis of fertility patterns. Recognizing the role occupational factors play in shaping fertility, and their significance in the development of targeted policies and interventions, it is imperative for future censuses to accurately and clearly capture data on occupation. While occupation remains elusive in this report, the report endeavours to provide valuable insights on other pertinent aspects of fertility in Liberia.

Chapter 3: Level, pattern and trends of fertility

3.1 Introduction

The preceding chapter evaluated the data employed in calculating fertility estimates for this report. This chapter proceeds to present the outcomes of the fertility analysis across various dimensions. Firstly, it offers a thorough examination of key reproductive rate indicators, encompassing CBR, GRR, NRR and TFR, within Liberia. Secondly, the chapter delineates the historical trajectory of fertility in Liberia. Lastly, it delves into the variations and differentials observed in fertility patterns within the country.

3.2 Levels of fertility rates - LPHC2022

Due to geographic differences, different rates of fertility were derived from the 2022 LPHC. Table 3.1 presents the fertility rates in the population.

3.2.1 Crude birth rates

Using the population of Liberia as a denominator, a CBR of 32.2 births per 1,000 population was recorded for the preceding year of the census. There was no stark difference in the observed CBR by place of residence. Urban and rural areas observed a rate of 32 births per 1,000 each, while at the county level, crude rates ranged from 29.9 births in both Grand Gedeh and Grand Cape Mount to 35.4 births in Maryland and River Cess. The estimated CBR of 32.2 births for Liberia is close to the 30.99 and 30.1 births per 1,000 population estimated by the United Nations World Population Prospects for the year 2022 and the 2019 LDHS respectively (LISGIS, 2020; UNDESA, 2022a). When examining CBRs across West Africa, Liberia (32.3) ranks fourth lowest, with Ghana (27.5) having the lowest CBR and Niger (45.3) the highest. Across broader African regions, Liberia's CBR falls below the averages of Eastern (33.2), Western (36.1), and Middle Africa (39.9), yet exceeds those of Oceania (15.6), Asia (14.3), North America (10.9), and Europe (9.2) as observed from Figure 3.3.

3.2.2 Replacement rates

The average number of daughters a woman of reproductive age would have during her lifetime if she passed through the prevailing ASFRs without mortality is 1.92 for Liberia, and 1.8 and 2.0 for urban and rural areas respectively. County-wise, the rate ranged from 1.8 daughters in Bomi to 2.5 in River Cess. Taking mortality into consideration, the NRR observed was 1.63, 1.5 and 1.6 for Liberia, urban and rural areas respectively. With the observed reproductive rates (GRR, NRR) greater than 1, it implies the cohort of women are having more than enough daughters to replace themselves in the population. When examining the NRR across countries in the Western Africa region in Figure 3.3, Liberia's rate (1.63) ranks as the second lowest, with Ghana (1.58) being the lowest and Niger (2.94) the highest. Comparing Liberia's NRR to other African regions, it falls below those of Eastern Africa (1.9), Western Africa (2.0), and Middle Africa (2.4), while exceeding that of Northern Africa (1.44) and the rest of the world regions.

3.2.3 Mean age at childbearing

Table 3.1 also shows that the MAC in Liberia is 28.8 years. It implies, on average, women in Liberia are having their first birth at age 28 years. This rate was slightly higher in urban (29.2) compared to rural (28.2) areas. There was no stark difference in the timing of birth at the county level compared with the national average; though the onset of first birth was lowest in River Cess (27.6 years) and highest in River Gee (29.4 years). When comparing MAC among West African countries, Liberia's MAC (28.8) ranks as the second lowest, with Sierra Leone (28.7) having the lowest, while Gambia records the oldest MAC mean age at childbearing at 30.4. Across various world regions, Liberia's MAC is higher than that of Southern Africa (27.8) and Asia (28.1), but lower than the averages observed in the rest of the world regions. Implying an early onset of childbearing in Southern Africa and the Asian regions than Liberia as observed in Figure 3.3.

3.2.4 Total fertility rate

The TFR for Liberia was estimated at 3.9, implying a woman will have an average of 3.9 children throughout her reproductive years if the prevailing ASFR persists. Comparing Liberia's 2022 TFR with other countries in the sub-Sahara African region, as estimated by the World Population Prospects by the United Nations for the year 2021, Liberia is much lower than the estimate for the average of West Africa (4.98) and Eastern Africa (4.24), but higher than Southern Africa (2.45). Compared to countries in the Western Africa (ECOWAS) Region, Liberia's TFR is lower except for Ghana (3.56) and Sierra Leonne (3.9) as seen in Figure 3.1.

The schedule of fertility in Liberia also varied by type and place of residence. For most countries in sub-Saharan Africa, fertility rates are higher in rural areas than urban areas. This is also the case for the Liberian 2022 census. For instance, women in rural areas will have an average of four children while women in urban areas will have an average of 3.7. Figure 3.2 shows the geographical distribution of fertility across the 15 counties in Liberia. The lowest TFR of 3.6 observed in both Grand Cape Mount and Montserrado counties while fertility was highest in River Cess County with an average of 4.8 children per woman.

Table 3.1. Levels of fertility rates by place of residence in Liberia

	CBR	GRR	NRR	MAC	TFR
Place of Residence					
Liberia	32.3	1.92	1.63	28.8	3.9
Residence					
Urban	32.2	1.8	1.55	29.2	3.7
Rural	32.1	2.0	1.60	28.2	4.0
County					
Bomi	31.0	1.8	-	28.0	3.8
Bong	32.7	1.9	-	28.5	3.9
Gbarpolu	31.5	1.9	-	28.4	4.1
Grand Bassa	30.9	1.9	-	28.1	3.9
Grand Cape Mount	29.9	1.8	-	28.8	3.6
Grand Gedeh	29.9	1.8	-	29.4	3.7
Grand Kru	35.1	2.3	-	28.7	4.4
Lofa	32.3	1.9	-	28.4	3.8
Margibi	30.8	1.8	-	28.8	3.7
Maryland	35.4	2.3	-	29.1	4.4
Montserrado	31.9	1.8	-	29.2	3.6
Nimba	33.7	2.2	-	28.0	4.4
River Cess	35.4	2.5	-	27.6	4.8
River Gee	33.3	2.1	-	29.4	4.4
Sinoe	32.5	2.0	-	28.5	4.0

Figure 3.1. Spatial distribution of fertility rates (2022)

Total Fertility Rate

Regional and neighbouring West African countries
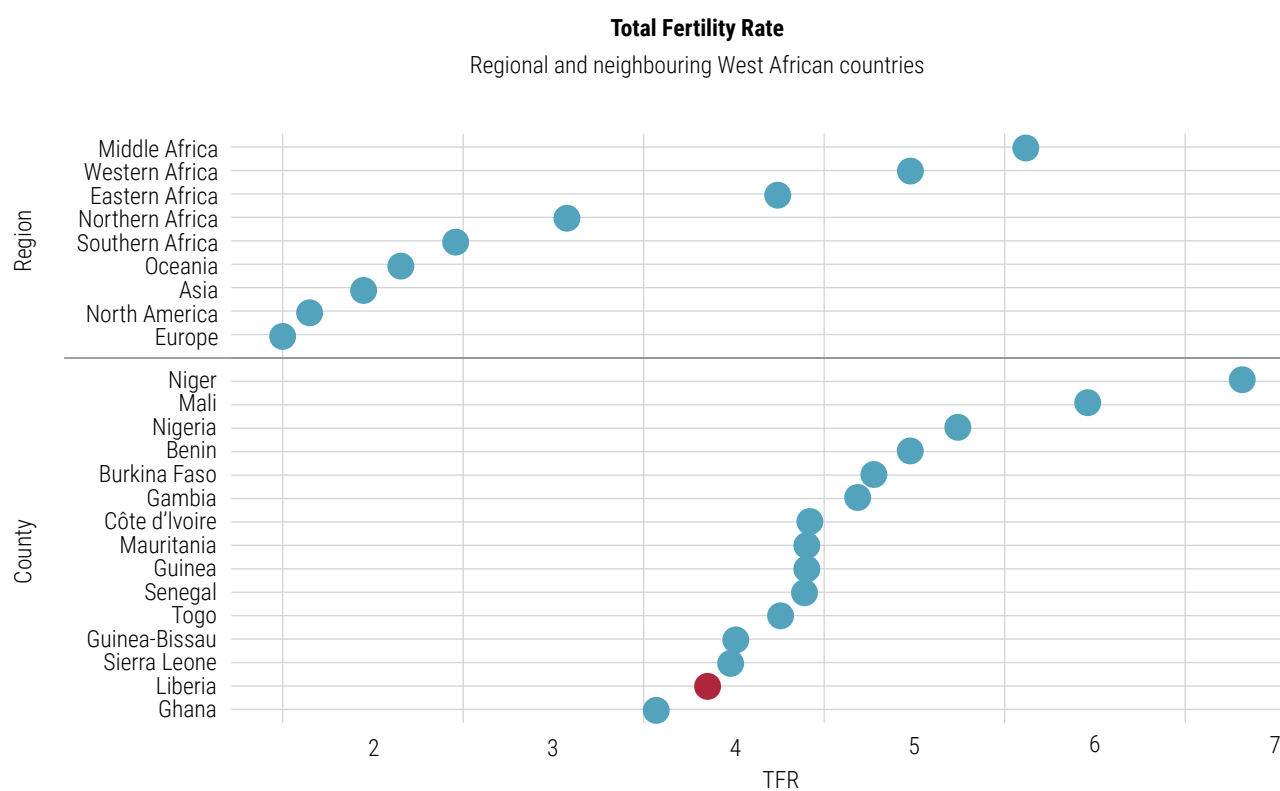
Source: LPHC (2022), World Population Prospects (2021)

Figure 3.2. Spatial distribution of TFR - Liberia 2022

Total Fertility by County
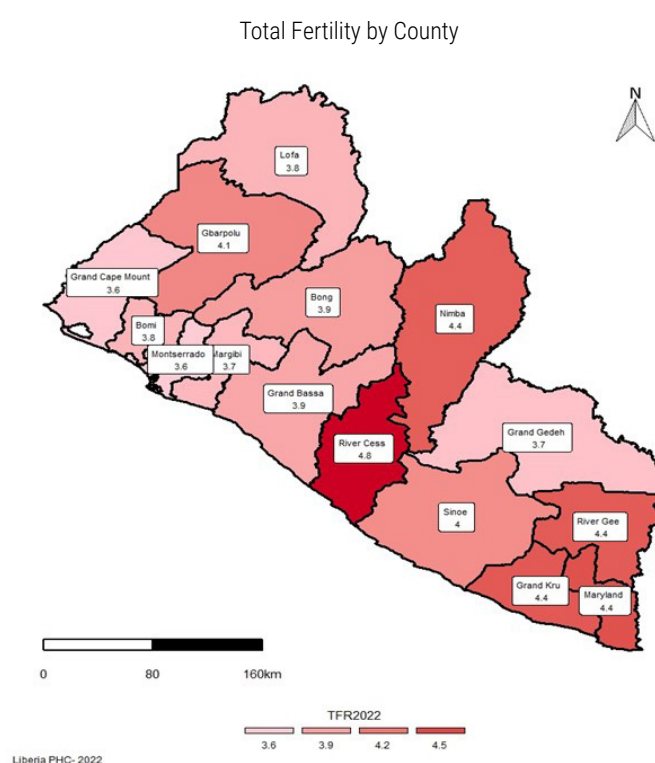
Figure 3.3. Regional rates of reproduction

A — Crude Brith Rate

B — Net Reproduction Rate

C   **Mean Age Childbearing**
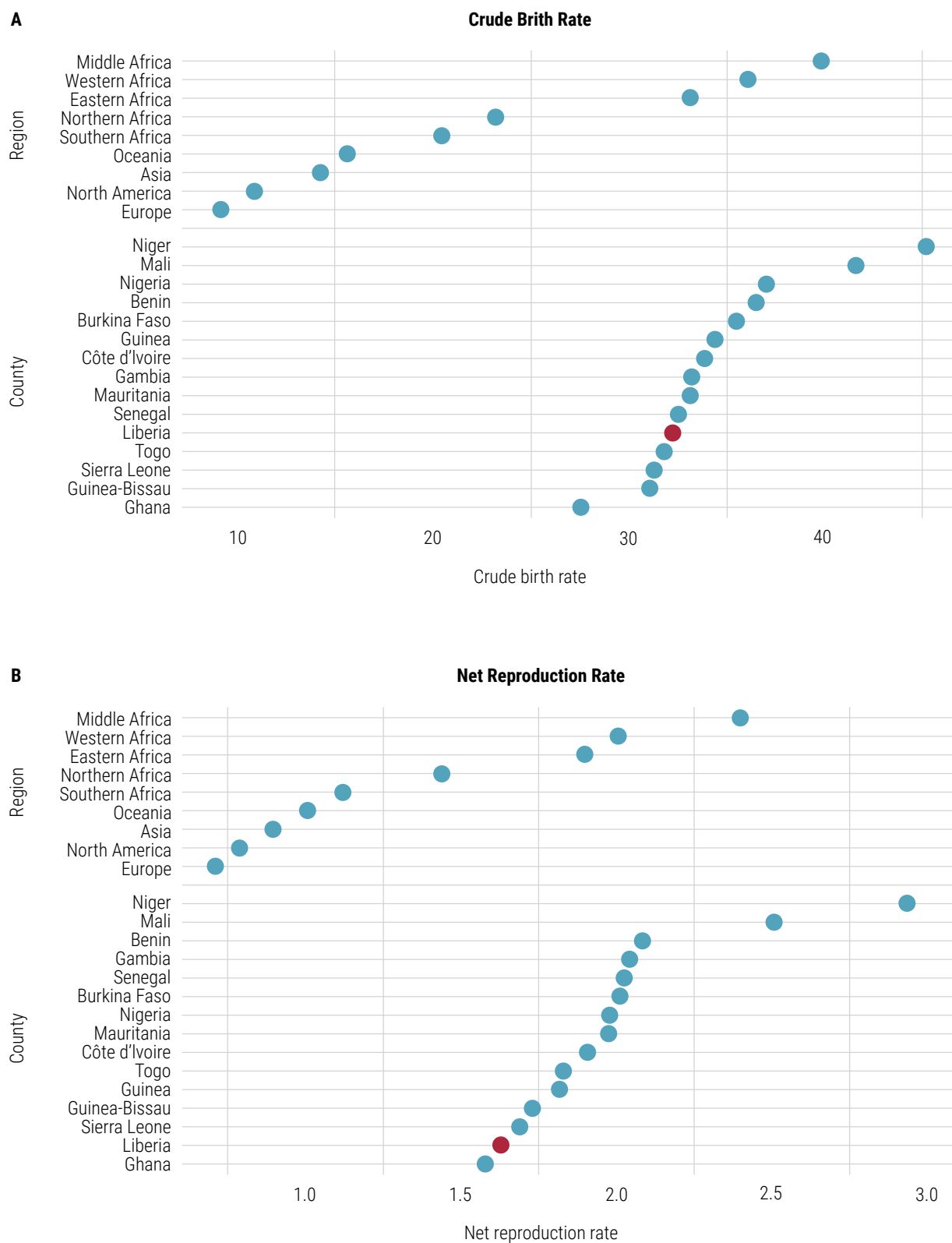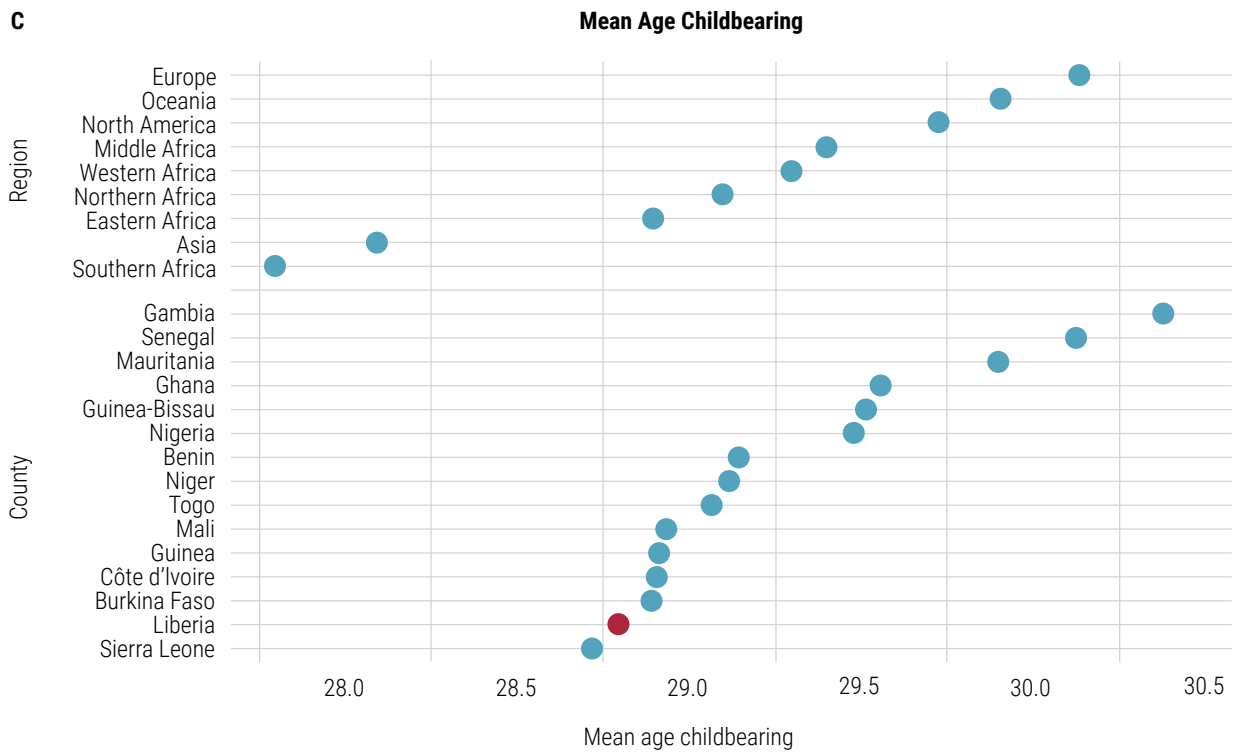
Source: LPHC (2022), World Population Prospects (2021)

3.3 Fertility trend

There have been substantial improvements in the reduction of fertility rates in Liberia. Fertility reduced from 7.1 children per woman in 1984 to 6.7 in 1986 then to 5.2 children in 2007; representing a reduction of 1.5 children per woman. However, there was an increase of 0.6 children per woman from the 1986 census. Also, there was a slight increase from 5.8 to 5.9 in the 2009 MIS survey. There has been a gradual decline in fertility from 5.9 in 2009 to 4.2 in 2016 and 2019 respectively. The 2022 LPHC reveals a further reduction to 0.3 children per woman in 2022 (Figure 3.4).

Figure 3.4. Trend of fertility in Liberia

TREND OR FERTILITY RATES IN LIBERIA
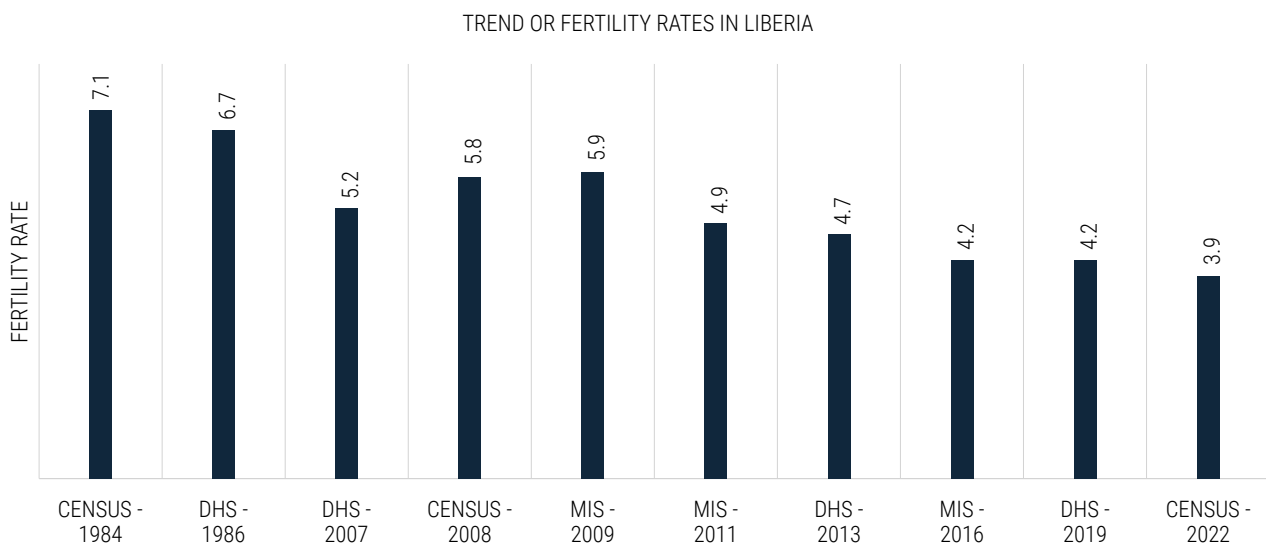
TFR has fallen from a high level to an intermediary level. Between 2008 and the current census, TFR fell from 5.8 to 3.85, representing a 33 per cent reduction in fertility rate.

3.4 Differentials of fertility

The preceding section provides an overview of fertility levels in Liberia. This section discusses fertility differentials with the aim of identifying specific groups of women characterized by either high or low fertility levels based on various demographic and socioeconomic attributes. These attributes include literacy, education, marital status, wealth status and a focus on persons with disabilities. The exploration of fertility differentials by demographers is integral for several compelling reasons. Traditionally, certain groups of women exhibit a predisposition toward higher fertility. A common hypothesis suggests that women with lower literacy levels and educational attainment tend to have higher fertility rates compared to their literate and highly educated counterparts. This hypothesis is rooted in the belief that educational pursuits, such as being in school, is associated with delayed childbearing and an enhanced understanding of contraceptive technologies, contributing to delayed and reduced childbearing.

Understanding fertility differentials is crucial for the development of effective strategies. Notably, fertility reduction has been at the core of Liberia's population policies since 1976. Interventions have been introduced with a focus on reducing fertility rates in the country. The Government and various stakeholders actively monitor developments related to the fertility transition process. By exploring fertility differentials, policymakers gain valuable insights into the diverse factors influencing fertility patterns, enabling the formulation of targeted and informed strategies to address the evolving dynamics of population growth in Liberia.

3.4.1 Fertility and literacy status

Regarding literacy (ability to read and write any simple sentence in any language) levels in Liberia, about six out of 10 (58.6 per cent) Liberians aged 5+ can read and write. While literacy does not determine fertility, the association suggests there may be some factors that relate education to fertility. Figure 3.5 shows fertility levels by literacy status in Liberia. The results show that women who are literate have an average of 3.8 children. In contrast, women who are not literate have an average of four children.

Figure 3.5. Fertility by literacy status

LITERACY STATUS
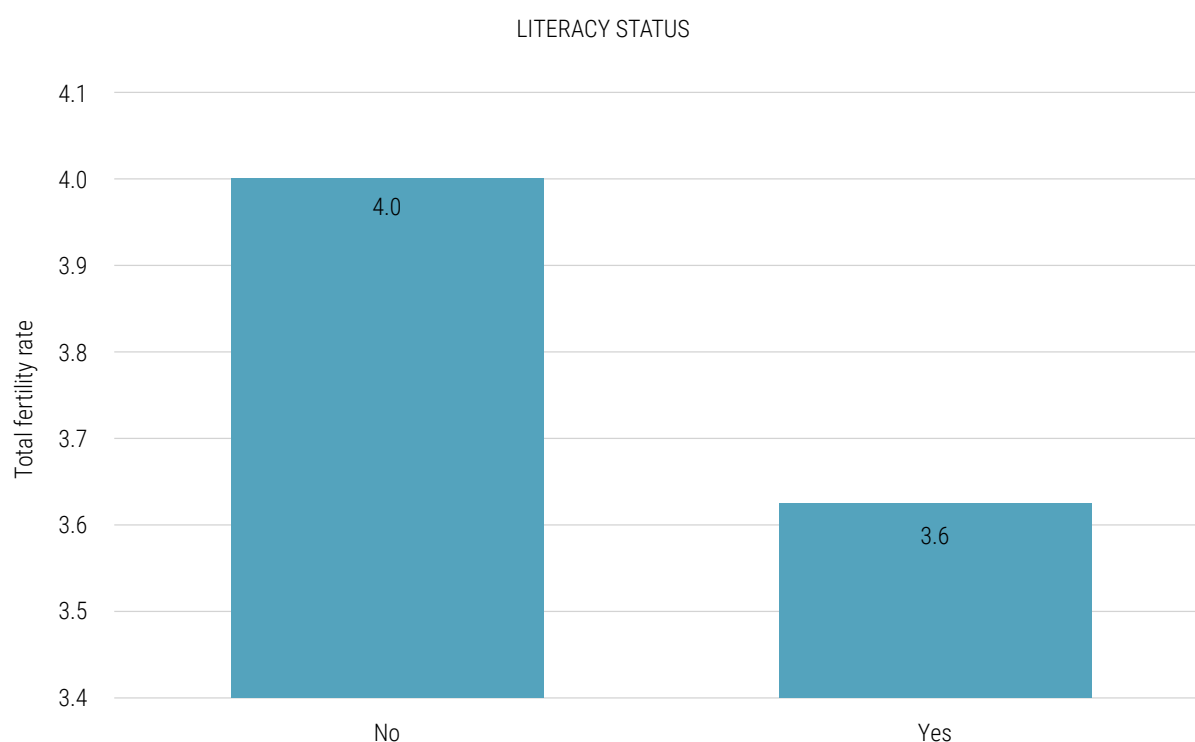
3.4.2 Fertility by education

Figure 3.6, shows the level of fertility based on educational attainment of women of reproductive age for both 2008 and 2022 censuses. Consistent with what has been observed in other parts of the world, there is an inverse relationship between education and fertility. Among those with no formal education, fertility rates dropped from an average of 7.2 to 4 children between 2008 and 2022 respectively. A similar observation was made for women with primary education; from an average of 6 to 4 children. However, there was a slight decrease in the fertility rate of women who had a minimum of secondary education, from 3.45 in 2008 to 3.4 in 2022, representing a decrease of 0.05 births.

This high rate of fertility among women with lower levels of education, particularly women with no formal education, is in tandem with findings from other low-and-middle-income countries such as Congo DC (7.5), Angola (7.5), Nigeria (6.7) and Gambia (6.5) (Measure DHS, n.d.). A possible explanation could be that little (primary) or no education may have little impact on fertility behaviour of women. The observed inverse relationship between female education and fertility, with the discernible impact beginning after basic education, underscores the importance of the acquisition of at least secondary education for females to influence fertility behaviour and, ultimately, reproductive health. This is because by virtue of staying longer in school, women acquire knowledge on reproductive health that shapes their reproductive decisions which ultimately affects their reproductive health. They are better informed on issues like FP and contraceptive usage, and other sexual reproductive health matters. This makes them better placed to utilize the information they have acquired in making decisions that positively impacts their overall reproductive health.

Figure 3.6. Fertility by educational status and census year

Education

2008   2022
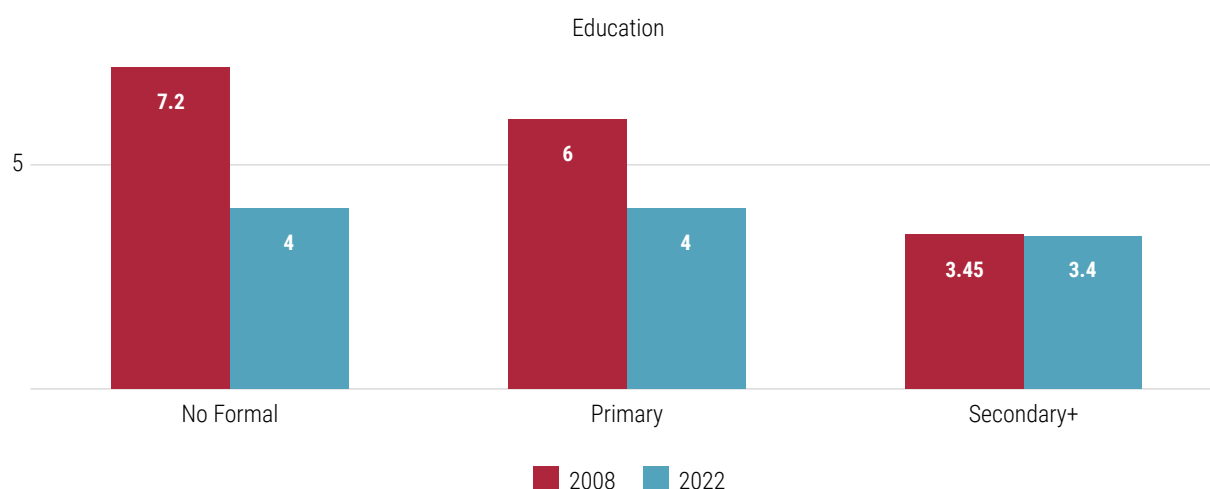
3.4.3 Fertility by marital status

Focusing on marital status, Table 3.2 presents the percentage distribution of women according to their marital status. The majority of women of reproductive age (WRA, aged 15-49) had never been in a marital union, comprising nearly 60 per cent. Approximately 34 per cent were currently in a marital union, with 32 per cent in monogamous unions and 2 per cent in polygamous unions. Additionally, 3.5 per cent were in consensual unions, while less than 3 per cent of WRA had previously been in a union.

Table 3.2. Percentage distribution of women in marital groups

Marital status	Women	Percent
Never married	877,360	59.73
Consensual union	51,104	3.48
Monogamous	473,300	32.22
Polygamous	25,734	1.75
Separated	18,571	1.26
Divorced	5,406	0.37
Widow	17,455	1.19
Total	1,468,930	

From Figure 3.7, we observe that between 2008 and 2022, there has not been much difference in the fertility levels of never married women. In 2022, the highest TFR was observed among women in unions (Consensual – 4.5, Polygamous – 4.5 and monogamous – 4.4), while the lowest was observed among never married women (3). Compared to fertility levels observed in 2008, substantial reductions have been observed among widowed women from six children per woman in 2008 to

4.1 children per woman in 2022. There was however a slight increase in the number of children among women in consensual unions from 4.4 in 2008 to 4.5 in 2022. This increase runs counter to the decline observed in other union categories. This may be as a result of couples or women in consensual unions seeking to have more children to secure a marriage, by proving their fertility as a manifestation of their reproductive capacity, and using children to establish marital unions (Elleamoh and Dake, 2019).

Figure 3.7. Fertility by marital status

Marital Status

	Never married	Consensual	Married - Monogamous	Married - Polygamous	Separated	Divorced	Widowed
2008	3.7	4.4	5.6	5.8	4.8	4.8	6
2022	3	4.5	4.4	4.5	3.8	3.7	4.1
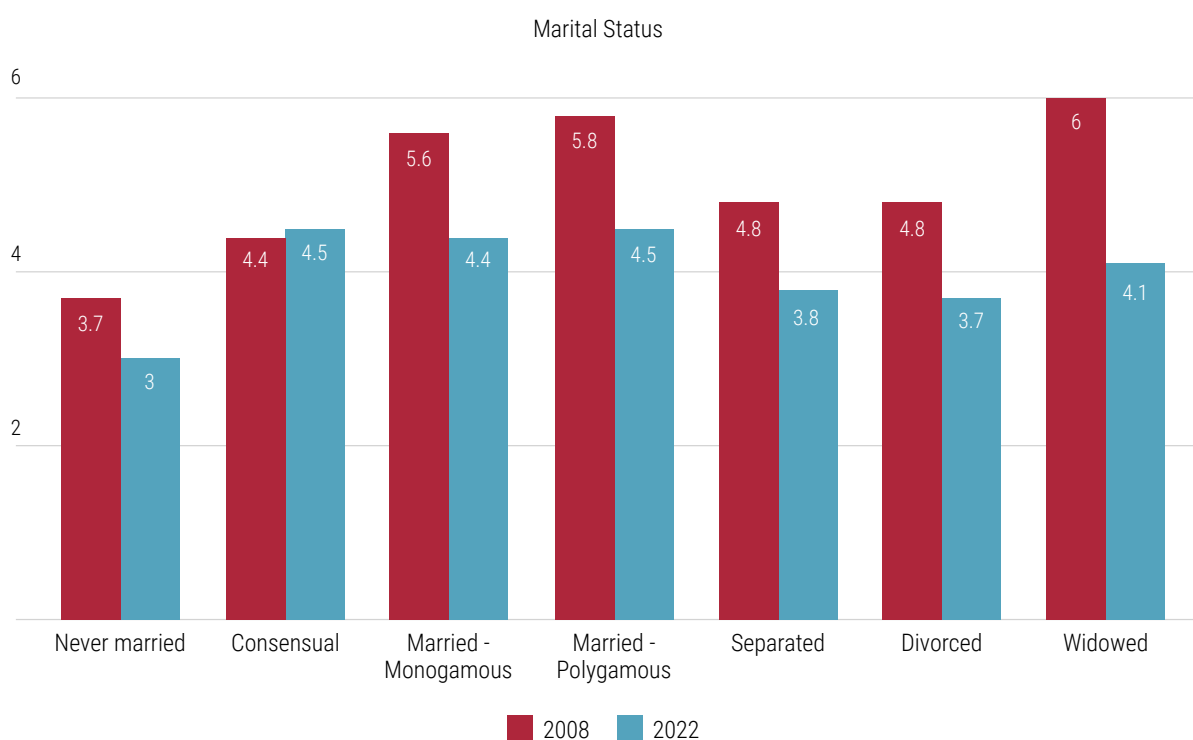
3.4.4 Fertility by wealth status

A measure of household wealth status was derived using Principal Component Analysis (PCA), which condensed multiple household asset variables into a smaller number of components. These components effectively captured the variability in wealth across households in Liberia. Subsequently, households were categorized into five equal-sized quintiles: poorest, poorer, middle, richer and richest, based on this measure. Further details regarding this process are elaborated in Section 7.1.

Figure 3.8 illustrates the fertility levels among women categorized by their wealth status. Women in the poor (poorest and poorer) and middle wealth categories

had an average of 3.6 births, while those in the richer and richest categories had an average of three births. This highlights the consistent inverse relationship between wealth status and fertility, indicating that women in higher wealth brackets tend to opt for smaller family sizes compared to those in lower wealth brackets.

Although the disparity in birth rates between the extreme wealth groups is minimal, there remains a notable difference in birth performance between the more affluent and less affluent categories within the wealth status. This difference amounts to less than one birth. A similar observation can be made regarding educational attainment.

Figure 3.8. Fertility by wealth status

Wealth Status
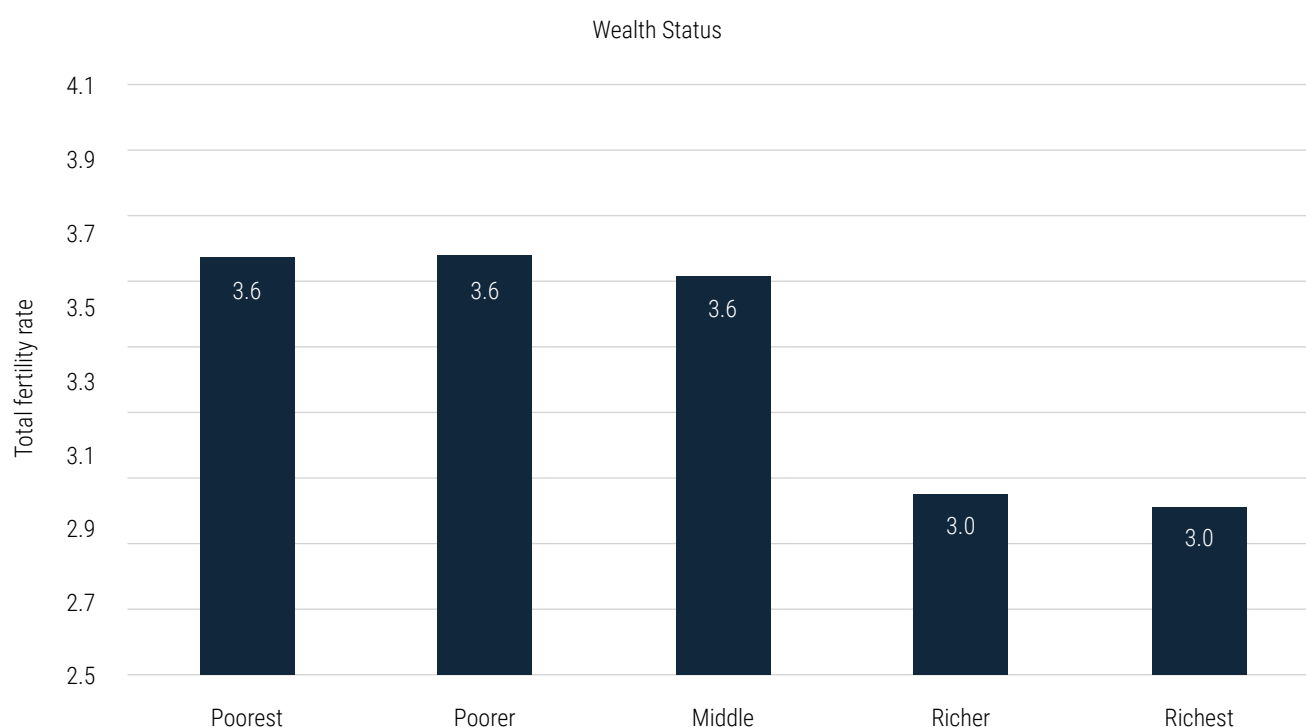
3.5 Fertility among disabled population

Estimating fertility rates for every sub-group of the population or background characteristic poses challenges. The methodology employed to adjust fertility may not be sufficient, especially for sub-populations with low representation, such as disabled women in Liberia. Due to the limited sample size, reliable estimates may be difficult to obtain for these specific groups. As an alternative, the completed

fertility of women, representing the mean number of children born to those aged 45-49, is utilized as a proxy measure for fertility among disabled women in Liberia. This approach is adopted due to the constraints associated with obtaining accurate fertility estimates within smaller and less represented sub-populations.

Table 3.3. Fertility among disabled women (15-49)

Disability	Women 45-49	Mean number of children born
Albino	1,285	3.74
Communicating	188	3.17
Hearing	289	3.56
Remembering	355	3.92
Seeing	726	4.52
Self-Care	303	3.31
Walking	902	4.31

Table 3.3 presents the mean number of children born to women with disabilities aged 45-49 years. The mean number of children born among disabled women was highest among women with visual impairment (4.5 live births), followed closely by women with walking disability (4.3 live births) and lowest among women with Self-Care (3.3) and communication disabilities in (3.2).

3.6 Summary and conclusion

Despite witnessing significant reductions in fertility levels among various social groups of women between the two censuses (2008 and 2022 LPHC), the findings from the 2022 LPHC indicate a departure from the perpetuation of high fertility behaviours among these groups. Traditionally, there has been a hypothesis that higher levels of education are associated with lower fertility, a pattern observed in the 2008 LPHC. Remarkably, this trend persists in the 2022 LPHC, although the differences in fertility among different social groups (education and wealth status)

have narrowed. For example, in terms of educational level, the least educated group had an average of seven children compared to the most educated group with an average of two children in the 2008 LPHC. In the 2022 LPHC, the gap has diminished, with the least educated women having an average of four children and the most educated having an average of three children. This trend remains consistent across other characteristics explored in this section.

The relatively stable fertility levels among these groups in the 2022 LPHC, compared to the 2008 LPHC, may be attributed to the modernization theory. According to this theory, differentials in fertility are expected to diminish as various counties have access to contraception, formal education, are literate and participate in labour force (Ryder, 1973, as cited in Yang and Morgan, 2003). The observed transitional nature of fertility differentials suggests that while initially concentrated in specific physical spaces or among particular social groups, the effects of modernization are gradually becoming more pervasive over time.

Chapter 4: Fertility among high-risk age groups (12-19 and 45+)

The previous chapter shed light on levels, trends and differentials of fertility in Liberia. This chapter explores fertility among high-risk age groups (women aged below 20 and 45-49), by levels, differentials and trend. In this chapter, the report anticipated that rate of birth among this age group will be lower as level of education increases.

4.1 Introduction

Adolescence encompasses physiological, social and cultural factors that define the transition from childhood to adulthood. Early childbearing significantly limits adolescents' life choices, impacting education, marital decisions and FP. Risks associated with adolescent pregnancy, prevalent among those aged 12-19, include increased morbidity, maternal and infant mortality, and complications such as fistula. These challenges disrupt a healthy transition into adulthood, affecting both the education and health outcomes of mother and child (Gebreegziabher et al., 2023; Tsega Dejen et al., 2022; UNDESA, 2020). Early pregnancies, often forced by prevailing social norms, perpetuate a cycle of poverty and lower socioeconomic status.

Similarly, childbearing among women, at an advanced age (45+) predicts negative birth outcomes compared to other age groups. Births to mothers in advanced ages are linked to obstetric complications, preterm and operative delivery, and perinatal death due to physiological deterioration and age-related perinatal risks such as hypertension, diabetes, and high body mass index (Bi et al., 2021; Gebreegziabher et al., 2023; Li et al., 2022; Londero, Rossetti, Pittini, Cagnacci, and Driul, 2019).

While pregnancy complications for advanced age groups are high, pregnancies among younger mothers (below 20) are generally considered more a social problem rather than a medical one. The reverse holds true for advanced-aged mothers (Heminnki et al. 1996). This chapter explores fertility among women in these special age groups (young mothers and advanced-aged mothers) as reproductive health in this demographic is a policy concern.

4.2 Levels of adolescent fertility in Liberia

Table 4.1 presents information on the age distribution of adolescent mothers, their live births and the proportion of adolescents who have already become mothers. The data indicates that, on average, adolescents between the ages of 12 and 19 give birth at around 15 years of age. Approximately 2 per cent of adolescents had a live birth in less than 12 months to the census, and about 9.25 per cent of adolescents are already mothers. Specifically focusing on the age group of 15 to 19, the table reveals that around 15 per cent of adolescents in this range are already mothers. Additionally, it highlights that, on average, 1 in every 10 seventeen-year-olds, one in every five eighteen-year-olds, and about one in every three nineteen-year-olds are adolescent mothers in Liberia. These findings are associated with average parities of 0.116, 0.206, and 0.324 children per adolescent in ages 17, 18 and 19 respectively. When juxtaposed with findings from the 2022 Rwanda PHC (NISR, 2023), where 2.6 per cent of adolescents aged 12-19 and 14 per cent of 19-year-olds were identified as mothers, the prevalence of adolescent motherhood in Liberia appears markedly higher. Specifically, in Liberia, 9.2 per cent of adolescents aged 12-19 and 32 per cent of 19-year-olds were reported as mothers. This suggests that the incidence of adolescent motherhood in Liberia is approximately three times higher than that observed in Rwanda.

Table 4.1. Age at childbearing among adolescents

Age	Adolescents	Age at first birth	Percent who had / are		Parity *
			Live Births	Mothers	
12	71,014	12	0.02	0.17	0.002
13	63,633	13	0.06	0.32	0.003
14	66,148	14	0.17	0.60	0.006
15	61,454	14	0.60	2.36	0.024
16	60,911	15	1.62	5.00	0.050
17	68,187	16	3.00	11.63	0.116
18	63,601	16	4.27	20.55	0.206
19	68,691	17	5.57	32.36	0.324
12-19		15	1.93	9.25	0.093
12-14		13	0.08	0.36	0.004
15-19		16	3.08	14.78	0.148
* Average					

4.3 Patterns of adolescent fertility

Just like the general population, variations exist in fertility among adolescents (15-19) with regards to different sociodemographic variables.

From Table 4.2, there was 9,944 live births to adolescents 12 months preceding the census. The adolescent birth rate (ABR) for Liberia is 76.2 per 1,000 women. The results indicate that about 15 per cent of adolescents are already mothers, with a mean parity of 0.148 births per adolescent and the relative contribution to overall fertility among WRA in Liberia is nearly 10 per cent.

With about 10 per cent of fertility in Liberia being contributed by adolescents, this masks some important variations by background characteristics. Table 4.2 also shows that 21 per cent of rural adolescents were mothers compared to 11 per cent of urban adolescents. There were 5,534 births among rural adolescents while 4,410 births were observed in urban areas. The average parity among rural adolescents is 0.21 while 0.11 was observed among urban adolescents with a relative contribution of 12 and 8 per cent respectively to TFR in Liberia. Although there are roughly twice as many moms in rural as in urban regions, there are different causes driving this behaviour in each case. In rural areas, early pregnancy in this age group usually happens in marriage or

sanctioned consensual unions or as a result of restricted access to FP options. On the other hand, early pregnancy is more common outside of marriage in urban regions and is impacted by social norms that support sexual liberation.

With respect to county, there is a wide variation of adolescent mothers, with highest rates in River Cess (29.5 per cent) to Gbarpolu (22 per cent), and Grand Gedeh (12 per cent) and Montserrado (9.8 per cent) having the lowest proportion of adolescent mothers. The proportion of adolescent mothers observed in River Cess is almost twice the national (15 per cent) average, thus about one in every three adolescents in River Cess have begun childbearing. The highest ABR was observed in River Cess (140.3 per 1,000), Gbarpolu (104.9), Nimba (104.8) and lowest in Grand Gedeh (62.2 per 1,000), Montserrado (56.8 per 1,000). However, while wide variations exist with the per cent of adolescent mothers in some counties, there is not much difference across counties in their average parity and relative contribution to fertility in Liberia. The highest adolescent relative contribution to the overall fertility was observed in River Cess (14.8 per cent), Bomi (13.5 per cent), Gbarpolu (12.9 per cent) and Grand Bassa (12.4 per cent), while the least contribution to fertility was observed in Grand Gedeh (8.5 per cent), Maryland (8.4 per cent) and Montserrado (7.9 per cent).

Table 4.2. Pattern of adolescent mothers (15-19) and contribution to total fertility

	Adolescents	Percent mothers	Live Births	ASFR	Mean Parity	TFR (15-49)	Relative contribution to TFR
National	**322,844**	14.8	9,944	76.2	0.148	**3.9**	9.9
Residence							
Urban	191,710	10.7	4,410	60.4	0.11	3.7	8.2
Rural	131,134	20.8	5,534	98.1	0.21	4.0	12.1
County							
Bomi	7,454	21.3	363	101.4	0.21	3.8	13.5
Bong	25,809	19.0	957	90.2	0.19	3.9	11.5
Gbarpolu	4,884	22.1	222	104.9	0.22	4.1	12.9
Grand Bassa	16,356	19.7	714	95.7	0.20	3.9	12.4
Grand Cape Mount	9,541	19.0	294	86.1	0.19	3.6	11.9
Grand Gedeh	13,249	12.5	312	62.2	0.13	3.7	8.5
Grand Kru	6,778	20.3	226	96.3	0.20	4.4	11.0
Lofa	24,118	14.7	475	74.5	0.15	3.8	9.9
Margibi	19,450	14.2	579	72.9	0.14	3.7	9.8
Maryland	11,982	13.1	405	74.5	0.13	4.4	8.4
Montserrado	125,568	9.8	2,615	56.8	0.10	3.6	7.9
Nimba	35,996	21.1	1,822	104.8	0.21	4.4	12.0
River Cess	4,624	29.5	367	140.3	0.29	4.8	14.8
River Gee	7,625	14.9	275	75.1	0.15	4.4	8.6
Sinoe	9,410	19.3	318	93.7	0.19	4.0	11.6
Literacy							
No	93,174	21.6	3,453	99.8	0.22	4.0	12.5
Yes	229,670	12.0	6,491	65.0	0.12	3.6	9.0
Schooling status							
Never attended	68,330	17.1	2,691	107.6	0.24	4.0	13.4
Drop-out	31,239	34.9	3,884	174.2	0.45	4.2	20.7
Attending	203,482	6.0	2,969	42.1	0.07	3.0	7.1
Completed	19,793	9.9	400	61.5	0.13	3.3	9.2
Education							
No Formal	98,351	21.1	3,809	100.5	0.21	4.0	12.5

Primary	132,646	12.9	4,207	76.3	0.13	4.0	9.4
Secondary +	91,847	10.8	1,928	55.0	0.11	3.4	8.1
Marital Status							
Never married	292,113	7.9	6,034	50.4	0.10	3.0	8.3
Married - Monogamous	21,498	48.1	2,846	243.0	0.67	4.4	27.4
Married - Polygamous	1,272	42.5	139	227.6	0.62	4.5	25.1
Separated	865	36.0	64	182.6	0.48	3.8	24.1
Divorced	176	26.1	15	152.6	0.36	3.7	20.6
Widowed	681	15.6	13	130.9	0.31	4.1	15.8
Consensual	6,239	38.6	841	178.7	0.48	4.5	19.8
Wealth Status							
Poorest	56,174	19.63	2,569	125.6	0.3	3.6	17.3
Poorer	60,385	16.25	2,439	107.1	0.2	3.6	14.7
Middle	67,116	13.88	2,442	95.9	0.2	3.6	13.4
Richer	67,152	9.45	1,613	70.5	0.1	3.0	11.8
Richest	72,017	5.11	881	44.9	0.1	3.0	7.6

The level of adolescent pregnancy has an association with the literacy status and level of education. From Table 4.2, among adolescents who are not literate, nearly 22 per cent are mothers and their relative contribution to TFR is 12.5 per cent, while among the literate group 12 per cent are mothers with a relative contribution of 9 per cent among the literate population in Liberia. Non-literate adolescents had a mean parity of 0.22 births, while literate adolescents had a mean parity of 0.12 births.

In terms of schooling status, about 6 per cent of adolescents who were currently attending school were mothers, compared to 10 per cent who had completed their level of education. On the other hand, among those who have never attended a formal school, 17 per cent were mothers, while about 35 per cent of adolescent school dropouts were mothers. The dropout mothers contributed 20 per cent of total fertility. In addition, there were 3,884 live births observed among adolescent school dropouts, 2,969 live births among those attending, 2,691 among the never attended while the least number of births was observed among those who have completed (400). A mean parity of 0.45 and 0.24 births per adolescent woman was observed among dropouts and adolescent who have never attended

school respectively, compared to 0.07 births among adolescent who are attending.

With respect to levels of education, the percentage of adolescent mothers is lower among those with primary education (12.9 per cent) than those with no formal education (21 per cent). Adolescents with secondary or higher education (10.7 per cent) had the least proportion among mothers. A similar trend was observed with regards to educational level. Adolescents with no formal education contributed the most (12.5 per cent) to fertility while those in secondary or higher education contributed the least (8.1 per cent). There were 4,207 births observed among adolescents with primary education, 3,890 live births among the no formal education group and least among those with secondary education, representing 1928 live births.

For marital status, a little over 40 per cent of adolescents in marital unions (monogamous or polygamous) were mothers, while about a third of adolescents who were separated (36 per cent) or in consensual union (38.6 per cent) were mothers. The least per cent of adolescent mothers was observed among those who were widowed (15.6 per cent) and never married (7.9 per cent). A total of 6,304

births was recorded among never married compared to 2,846 adolescents in monogamous unions. The highest mean parity was observed among adolescents in marital unions.

The analysis revealed an inverse relationship with wealth status. Over 15 per cent of adolescents in the poor category (20 per cent poorest and 16 per cent poorer) were mothers, while among those in the middle category, 14 per cent were mothers. Conversely, less than 10 per cent of adolescent mothers were observed among those in the rich (9 per cent richer and 5 per cent richest) categories. Regarding live births, the majority occurred among the poorest groups, totalling 2,569 births, whereas about a third of that number was observed among those in the richest category (881). The average parity was 0.3 births among the poorest, with 0.2 births each among the poorer and middle wealth groups. On the other hand, the average parity was 0.1 births among both the richer and richest wealth group. Furthermore, the relative contribution to overall fertility in Liberia was 17 per cent among those in the poorest category and least (8 per cent) among those in the richest category.

4.4 Fertility among women 45-49

The preceding section of this chapter focused on adolescent fertility. This section delves into fertility among women aged 45-49 (45+). Late fertility, defined as the percentage of women aged 45+ who have given birth within their age group, is among the measures used here. However, it is worth noting some limitations. Firstly, the data only accounts for births occurring within the last 12 months, potentially omitting births that occurred earlier to women in the age group. Moreover, while multiple births within a 12-month period are possible, this is relatively uncommon in this age cohort, given the lower birth tempo characteristic of this demographic.

From Table 4.3, at the national level, 804 births were recorded among 85,783 women aged 45-49, representing 0.94 per cent LFR. The birth rate for women aged 45-49 in Liberia is 37.4 per 1,000 women, an average parity of 3.94 births and a relative contribution of 4.9 per cent to Liberia's TFR. The mean parity among this age group is expected to be comparable with the overall fertility in Liberia in a situation of constant fertility.

Also, 456 births were reported to rural while urban women in the age group recorded 348 births,

representing a LFR of 1.10 per cent and 0.79 per cent in rural and urban areas respectively. The age-specific fertility rate for women in rural areas was relatively high compared to what was observed in urban areas at 38.4 per 1,000 women and 35.8 births per 1,000 women respectively. The mean parity for women aged 45-49 for rural areas was 4.11 whiles women in urban areas will have 0.38 children less (3.78),

Across counties, more live births were recorded in Montserrado (220) followed by Nimba (149), however, the highest LFR was recorded in Nimba county representing 1.41 per cent followed by Grand Bassa with 1.35 per cent while the least LFR was observed in both Gbarpolu and Lofa county with 0.57 per cent. In addition, high birth rates were observed in River Gee, River Cess and Grand Kru with 49.5, 48.7 and 45.6 births per 1,000 women respectively. Birth rates were however the lowest in Bomi, Grand Bassa and Lofa counties with 33.6, 33.1 and 31.3 births per 1,000 women respectively. The highest mean parity was observed in Maryland and River Cess with 4.74 and 4.52 children respectively, while the lowest mean parity was observed among women in Montserrado and Grand Cape Mount with 3.67 and 3.51 births respectively.

Regarding literacy, literate women reported 252 births, while non-literate women recorded 552 births, representing 0.84 per cent and 0.99 per cent LFR. The birth rate observed among literate women was 33.3 births per 1,000 women   compared to 39 births per 1,000 that was observed among women who are not literate. When considering mean parities, literate women in this age group had 0.23 births less than what was observed among non-literate women (4.02)

There were 569 live births recorded among women with no formal education, 100 live births among women with primary education and 139 live births was reported among women with secondary education or higher in the 12 months prior to the census, representing a LFR of 1.03, 0.99 and 0.68 per cent respectively. There was not much difference between women with no formal education (38.5 births per 1,000) and women with primary education (36.7 births per 1,000 women). Women with secondary plus education on the other hand reported a relatively lower birth rate (31 births per 1,000 women). When assessing mean parities, women with secondary education or higher reported 3.48 children, those with no formal education reported 4.08 children, and women with only primary education had 4.18 births. This contrasts with the anticipated outcomes based on educational levels.

With respect to marital status, there were more live births recorded among women in monogamous unions (543) and never married (169). LFR was more among women in consensual unions (1.18 per cent), following closely was women in monogamous unions (1.12 per cent). Nearly 50 births per 1,000 was observed among women who were separated, followed by 43 births per 1,000 among women currently in marital unions. Low birth rates were observed for women who have never married (29.8 births per 1,000) and widowed women (29.2 births per 1,000 women).

Additionally, in relation to wealth status, a higher incidence of births was documented among women classified as the poorest, whereas the lowest number of live births was observed among women categorized as the wealthiest. A similar pattern emerged concerning LFR; women in the poorest category exhibited an LFR of 1.24 per cent, while those in the richest category had the lowest rate at 0.67 per cent. In terms of parity, there were, on average, 4.8 births per woman in the poorest, poorer, and middle wealth categories, 3.9 births in the richer category, and 3.7 births in the richest wealth category.

The relative contribution of women aged 45+ to TFR was about 5 per cent nationally. Similar observation was made across place of residence as well as other demographic and socioeconomic characteristics.

Table 4.3. Pattern of fertility among women aged 45-49

	Women 45+	Live births	Late fertility rate (%)	ASFR	TFR (15-49)	Mean parity	Relative contribution to TFR (%)
National	85,783	804	0.94	37.4	**3.9**	3.94	4.9
Residence							
Urban	44,256	348	0.79	35.8	3.7	3.78	4.9
Rural	41,527	456	1.10	38.4	4.0	4.11	4.7
County							
Bomi	2,461	15	0.61	33.6	3.8	3.74	4.5
Bong	7,894	64	0.81	37.3	3.9	4.01	4.8
Gbarpolu	1,590	9	0.57	42.2	4.1	3.90	5.2
Grand Bassa	5,053	68	1.35	33.1	3.9	3.84	4.3
Grand Cape Mount	2,550	25	0.98	38.8	3.6	3.51	5.4
Grand Gedeh	3,701	48	1.30	38.4	3.7	3.80	5.3
Grand Kru	1,717	22	1.28	45.6	4.4	4.39	5.2
Lofa	5,601	32	0.57	31.3	3.8	3.91	4.2
Margibi	5,049	52	1.03	35.1	3.7	3.88	4.7
Maryland	2,882	29	1.01	43.8	4.4	4.74	4.9
Montserrado	30,109	220	0.73	35.1	3.6	3.67	4.9
Nimba	10,602	149	1.41	39.2	4.4	4.40	4.5
River Cess	1,855	20	1.08	48.7	4.8	4.52	5.1
River Gee	2,238	21	0.94	49.2	4.4	4.31	5.6
Sinoe	2,481	30	1.21	39.6	4.0	4.30	4.9

Literacy							
No	55,763	552	0.99	39.01	4.0	4.02	4.9
Yes	30,020	252	0.84	33.29	3.6	3.79	4.6
Education							
No Formal	55,093	569	1.03	38.5	4.01	4.05	4.8
Primary	10,135	100	0.99	36.7	4.04	4.18	4.5
Secondary +	20,555	139	0.68	31.2	3.38	3.48	4.6
Marital Status							
Never married	24,764	169	0.68	29.81	3.0	3.17	4.9
Married - Monogamous	48,355	543	1.12	43.97	4.4	4.27	4.9
Married - Polygamous	2,616	25	0.96	43.35	4.5	4.27	4.9
Separated	2,244	21	0.94	49.59	3.8	3.88	5.5
Divorced	976	7	0.72	35.78	3.7	3.94	4.7
Widowed	4,627	17	0.37	29.24	4.1	4.21	4.0
Consensual	2,201	26	1.18	41.89	4.5	4.35	5.1
Wealth Status							
Poorest	17,984	223	1.24	43.0	3.6	4.83	5.9
Poorer	17,562	177	1.01	45.4	3.6	4.83	6.2
Middle	16,586	149	0.90	45.6	3.6	4.79	6.4
Richer	16,278	138	0.85	37.5	3.0	3.97	6.3
Richest	17,373	117	0.67	37.6	3.0	3.74	6.4

4.5 Trends in fertility among high-risk populations

Figure 4.1 shows the trend in fertility among high-risk group. Among women 15-19, there has been a decline in births between 2008 and 2022 across Liberia. A similar observation was made for women aged 45-49, particularly in Grand Kru where ASFR fell from 297 to 45.6 births per 1,000 women, representing an 84 per cent decline between 2008 and 2022. While substantial progress has been made in reducing birth rates generally in both age groups (15-19 and 45-59), adolescents in Nimba and River Cess counties nonetheless recorded a slight increase in birth over the period. Specifically, Nimba County observed a 1.8 per cent increase (103 to 104.8 births) while Rive Cess reported a 19 per cent increase (117 births to 140 births) in adolescent births.

Figure 4.1. Trends in age-specific fertility rate, 15-19 and 45-49

A - Age specific fertility rate 15 - 19

B - Age specific fertility rate 45 - 49
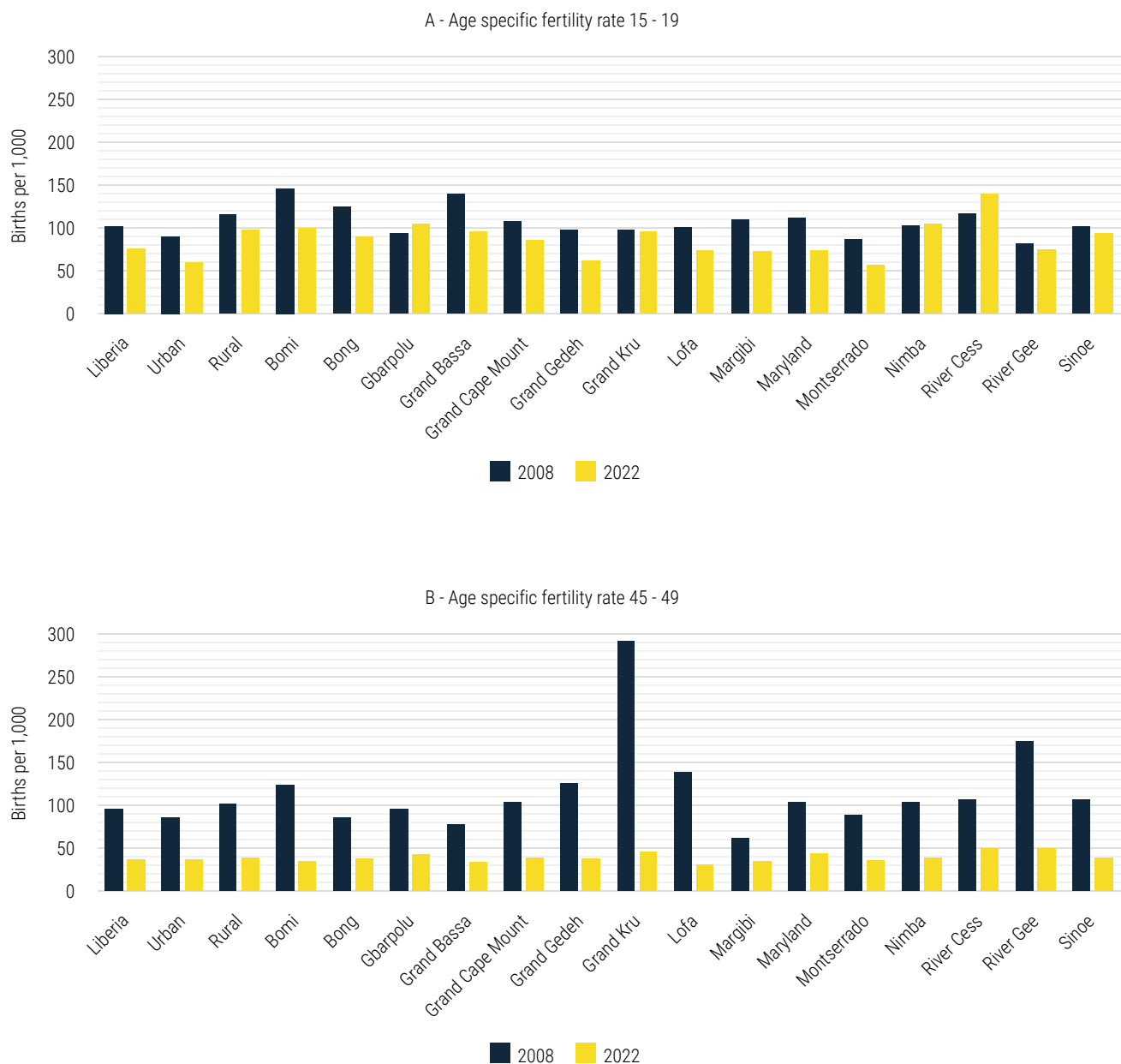
4.6 Summary and conclusion

The age at which childbirth occurs poses significant health risks for both the mother and the child. Early childbearing not only impacts a woman's cumulative fertility but also extends her reproductive period, leading to higher fertility rates and increased health risks for both mother and child. This has emerged as a prominent health concern and social issue in Liberia.

The rates of adolescent childbearing in Liberia are among the highest in Africa. The prevalence of early childbirth and pregnancies among adolescents is associated with clandestine abortions, contributing to a high number of young mothers leaving school. Of particular concern is the substantial proportion of adolescent mothers among those with limited or no formal education. Among school dropouts, a staggering 35 per cent were adolescent mothers, highlighting a significant correlation between educational disengagement and early pregnancies.

Conversely, for those adolescents who remained in school, a lesser incidence of pregnancy was recorded. The pronounced disparity in adolescent motherhood, especially among those with limited secondary education, is not out of the ordinary, given

the tendency of many adolescents to discontinue their education upon pregnancy. This phenomenon may be attributed to the relatively free nature of basic education in Liberia (GoL, 2011), with the associated expenses of secondary education acting as a deterrent for some adolescents. Research indicates a reciprocal relationship between teen dropout and subsequent adolescent pregnancy, illustrating that pregnancy serves as both a driver and consequence of school discontinuation among adolescents (Ardington, Menendez, and Mutevedzi, 2015; Rosenberg et al., 2015; Stoner et al., 2019).

With nearly 10 per cent (9.5) of adolescents having been in a marital union in the present data, early marriage has consequences for adolescents'

education and raises concerns about potential human rights violations. The Government of Liberia should prioritize and strengthen measures to discourage early marriage and childbirth, emphasizing the importance of continued education for adolescents.

While efforts are being made to address the issue of early childbearing, it is equally imperative to focus on late childbearing. Caregivers should provide information with evidence-based knowledge to support women's procreation choices at older ages and enable early detection of adverse outcomes. This multifaceted approach is crucial for promoting reproductive health and addressing the complex dynamics surrounding childbirth among special age groups in Liberia.

Chapter 5: Childlessness in Liberia

The previous chapter explored fertility (births) among people in high-risk age group. This chapter also explores childlessness in Liberia.

5.1 Introduction

Motherhood commands significant reverence in various African societies, underscored by a deep cultural focus on family life and the act of bearing children. In many developing nations, children are considered as valuable economic assets and are perceived as a fundamental source of social support and care in the ageing process (Baranowska-Rataj and Abramowska-Kmon, 2019; Caldwell and Caldwell, 1987; Liamputtong and Benza, 2019). Fertility desires encapsulate the choices individuals make concerning having, delaying or abstaining from bearing children, representing one's sexuality and reproductive autonomy. Empowering individuals to make informed reproductive choices, including the decision of how many children to have and when to have them, is important (Mburu et al., 2023).

However, several social and cultural factors, such as personal choice, delayed marriage or infertility, can influence the realization of these desires into actual reproductive outcomes. Despite the average woman in Liberia having approximately four children, there exists a segment of the population (women) who have never experienced childbirth. While global health initiatives have understandably prioritized strategies to reduce overall fertility rates, the significance of addressing issues related to infertility remains paramount (Mascarenhas, Cheung, Mathers, and Stevens, 2012). A nuanced understanding of the prevalence and distribution of childlessness is crucial for formulating evidence-based policies aimed at alleviating the burden of childlessness in Liberia. In the context of this report, childlessness is defined as the proportion of women who remain childless by the time they reach the age of 40.

5.2 Level and pattern of childlessness in Liberia

While Chapter 4 has shown that early childbearing is a common phenomenon in Liberia, a number of women nonetheless remain childless by age 40. While other studies posit that the level of childlessness is a rare phenomenon in Liberia (LISGIS, 2019), data from this present census shows that, about one in every five women (21 per cent) aged 40-49 is childless. In Table 5.1 Childlessness was found to be high in rural areas (22.6 per cent) than urban ones (19.8 per cent) respectively.

With respect to county patterns, high rates of childlessness were observed in Grand Cape Mount (28.3 per cent), River Gee (26.5 per cent) and Bomi (25.2 per cent) counties, while the lowest rates of childlessness were observed in River Cess (18.7 per cent), Maryland (18.8 per cent) and Montserrado (19.4 per cent).

Table 5.1. Level and pattern of childlessness in Liberia

	Number of women (40 - 49)	Percent Childless
Liberia	**226,743**	21.13
Type of place of residence		
Urban	116,454	19.75
Rural	110,289	22.58
County		
Bomi	6,614	25.22
Bong	21,760	20.67
Gbarpolu	4,458	21.24
Grand Bassa	13,333	22.91

Grand Cape Mount	7,038	28.33
Grand Gedeh	10,047	23.41
Grand Kru	4,543	21.64
Lofa	15,472	20.62
Margibi	13,823	21.80
Maryland	7,248	18.85
Montserrado	79,769	19.45
Nimba	26,156	20.62
River Cess	4,315	18.73
River Gee	5,463	26.51
Sinoe	6,704	25.01
Literacy		
No	143,180	23.73
Yes	83,563	16.66
Education		
No Formal	141,158	23.62
Primary	26,660	17.41
Secondary +	58,925	16.68
Marital Status		
Never married	70,018	31.25
Married - Monogamous	126,477	16.37
Married - Polygamous	6,614	18.64
Separated	5,712	17.45
Divorced	2,242	18.91
Widowed	9,405	17.82
Consensual	6,275	15.82
Wealth Status		
Poorest	48,885	14.26
Poorer	45,827	14.85
Middle	42,618	12.14
Richer	42,922	19.99
Richest	46,491	12.39

Childlessness also varies across sociodemographic characteristics. In Table 5.1, among women with no literacy skills, about 24 per cent are childless, while 16.7 per cent of literate women are childless. With respect to level of education, Table 5.1 shows a downward pattern of childlessness as level of education increases, (from 23.6 per cent to 16.7 per cent). Voluntary childlessness is rare in Liberia. The highest level of childlessness was observed among women who are never married (31.2 per cent), then among divorced (18.9 per cent) and women in polygamous (18.6 per cent) unions. The least childlessness was observed among women in consensual unions with 15.8 per cent.

With respect to wealth status, childlessness was highest among women in the category of the richer (20 per cent), poorer (15 per cent), poorest (14 per cent) and least observed among those in the richest (12.4 per cent) and middle (12 per cent) categories. This observation deviates from the anticipated linear relationship between wealth status and childlessness, as well as other fertility differentials observed in this report. Possible factors contributing to this deviation include social influences and cultural norms, such as delayed marriage, educational attainment and access to healthcare, as well as the potential interaction between them.

5.3 Childlessness among disabled people

In this section, a person with disability is identified as someone falling within a range of categories, including being albino or experiencing challenges in communication, hearing, memory, vision, self-care and mobility. In Table 5.2, the highest level of childlessness was observed among women facing difficulties in communication (37.8 per cent), closely followed by those encountering challenges in self-care (36.3 per cent). The disability group with the lowest childlessness rate included women experiencing difficulties in walking (23 per cent), vision impairment (23.8 per cent), and those with albinism (23.9 per cent).

Despite childlessness being relatively higher among disabled individuals compared to the national average of 21 per cent, the childbearing desires among women with disabilities (WWD) are not significantly different from those without disabilities. This challenges the misconception that WWD are asexual and biologically incapable of desiring and having children (Ganle, Apolot, Rugoho, and Sumankuuro, 2020).

Table 5.2. Childlessness among disabled women

	Number of women (40 - 49)	Percent Childless
Disability		
Albinism	3,426	23.9
Communicating	484	37.8
Hearing	**703**	32.9
Remembering	834	33.6
Seeing	1,548	23.8
Self-Care	702	36.3
Walking	**1,851**	23.0

5.3 Trend of childlessness

Figure 5.1 shows the prevalence of childlessness in Liberia over the period of 2008 and 2022. The findings suggest a decline in the level of childlessness in Liberia and its counties. In the 2008 PHC, childlessness was 35 per cent, which significantly reduced to 21 per cent, suggesting a shift in reproductive behaviour. Similar declines in childlessness were also observed across the

counties of Liberia. Grand Gedeh, River Gee and Sinoe observed declines in childlessness aligning with the national trend. Maryland observed the most declines from 40 per cent in 2008 to about 19 per cent in 2022. The same observation was made in Montserrado from 39 per cent to 19 per cent. Bomi, River Gee and Sinoe, though reporting declines in childlessness, yet had a relatively higher figure than the national average of the 2022 PHC.

Figure 5.1. Prevalence of childlessness in Liberia, PHC 2008 - 2022

Prevalence of childlessness in Liberia, 2008 - 2022
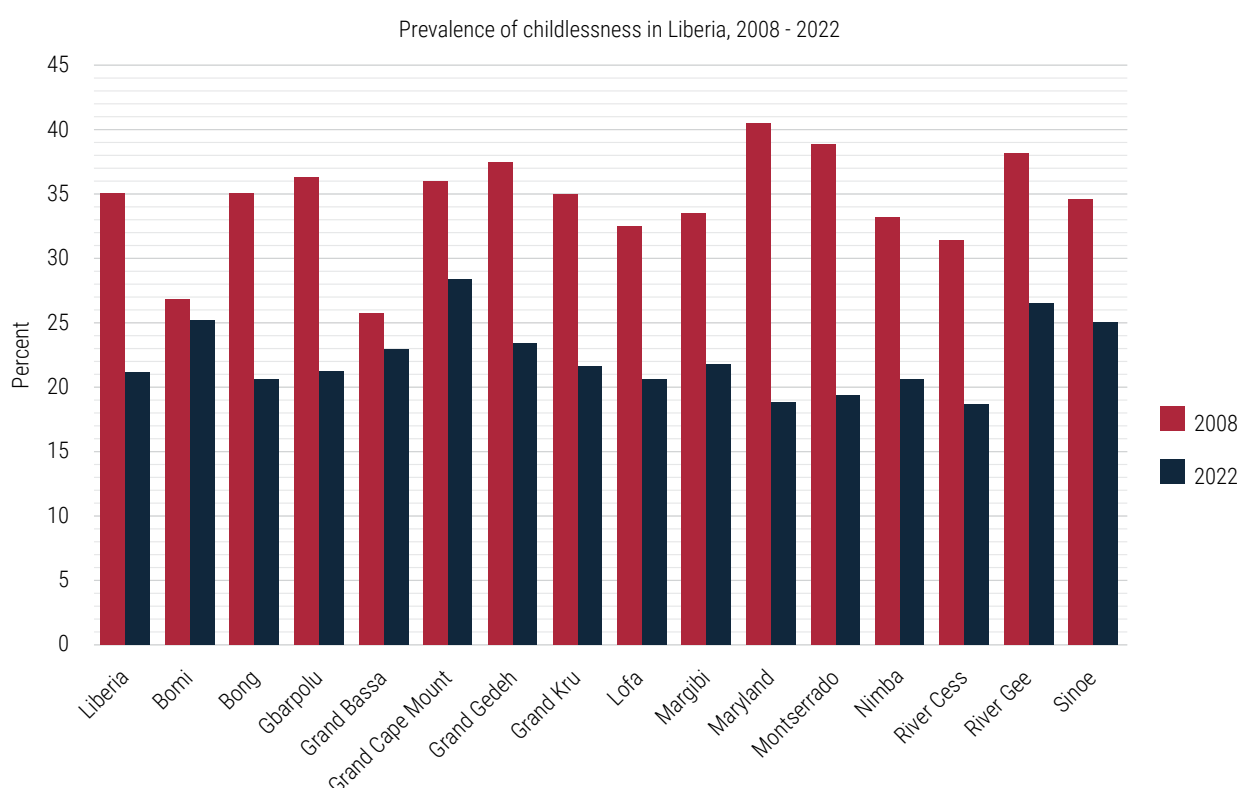
5.4 Summary and conclusion

The prevalence of childlessness has reduced in Liberia from 35 per cent in 2008 to 21 per cent in 2022. Similar declines were observed across counties. Globally, approximately one in six individuals experiences infertility during their lifetime, irrespective of geographical location (Cox et al., 2022; Polis, Cox, Tunçalp, McLain, and Thoma, 2017). This chapter highlights the fact that about one in five women in Liberia experience childlessness, and this prevalence differs based on demographic and socioeconomic factors. Women lacking formal education or literacy skills and those who have never been married tend to have higher rates of childlessness. Similarly, WWD, of varying forms, also face elevated levels of childlessness. By utilizing education level as a proxy for socioeconomic status, it becomes apparent

that women with lower educational attainment or experiencing a disability may encounter obstacles in accessing information related to FP and reproductive health. Their knowledge regarding factors influencing fertility and available healthcare services providing FP may be limited compared to women of higher socioeconomic status (Purkayastha and Sharma, 2021). Furthermore, the financial constraints associated with reproductive technologies or medical consultations could pose a barrier for those in need of such services (Njagi et al., 2023).

This chapter unveils disparities in childlessness levels across diverse demographic groups in Liberia. This finding underscores the need for the development of policies and interventions aimed at assisting couples or individuals in realizing their fertility goals.

Chapter 6: Conclusion, policy implications and recommendations

6.1 Conclusion

Comparing the two most recent censuses, it is evident that Liberia has experienced a significant reduction in fertility rates, dropping from 5.8 in 2008 to 3.9 in 2022, marking a noteworthy 33-per cent decline. This implies that, assuming age-specific fertility patterns remain constant, an average woman would conclude her reproductive years with a range of 3 to 4 children. This decline reflects positive strides in the implementation of fertility reduction policies and strategies aimed at achieving SDGs related to RMNCAH in Liberia. The estimated TFR utilizing the Gompertz model stands at 3.9, slightly lower (0.2 births) than the 4.09 projected by the United Nations World Population Prospects (WPP) in 2021 (UNDESA, 2022b).

While the national target of 4.2 children per woman has been met, the LPHC 2022 data shows that fertility in Liberia exhibits variations based on geographical location, demographic attributes and socioeconomic factors. For instance, women in rural areas reported a higher fertility rate (4.0) compared to their urban counterparts (3.7). Geographically, certain counties such as River Cess, Grand Kru, Maryland, and River Gee reported TFRs that are slightly above the national target of (TFR ranging from 4.8 to 4.4), while Montserrado and Grand Cape Mount County have the lowest TFR of 3.6. Notably, there is an observed relationship between high fertility rates and sociodemographic factors such as non-literacy, lower educational attainment, consensual relationships and lower socioeconomic statuses. This suggests potential disparities in access to reproductive health services, including contraceptive methods and the availability of skilled healthcare staff.

The report also sheds light on the relatively high adolescent fertility levels in Liberia, with the current rate standing at 76 births per 1,000 adolescents (15-19), contributing 9.9 per cent to the national TFR. This ABR is relatively lower when compared with the figures from Liberia's neighbouring countries (Côte d'Ivoire - 158 per 1,000, Guinea – 82.9 per 1,000), but much higher compared to Rwanda (24 per 1,000). Nationally, 3 per cent of adolescents in this age group had a live birth, and almost 15 per cent were already mothers. Notably, adolescent motherhood is concentrated among those aged 18 and 19, where 1 in 5 and 1 in 3 adolescents, respectively, have already become mothers. The percentage of adolescent mothers varies based on demographic and socioeconomic factors, with higher numbers observed in rural areas, and among adolescents with lower levels of education and wealth statuses.

Furthermore, the findings reveal that about 1 in 5 women aged 40-49 in Liberia are childless, with higher rates observed in rural areas compared to urban areas. Grand Cape Mount stands out with nearly 1 in every 3 women (40-49) being childless. Socioeconomically, childlessness is more prevalent among women with lower levels of education.

6.2 Implications

The implications of medium fertility rates as well as early and late childbearing have far-reaching impacts; including accelerated population growth, adverse maternal and child health outcomes, and diminished levels of female education, empowerment and participation in the labour force. The rapid expansion of the population poses obstacles to attaining socioeconomic development, amplifying the need for more resources to achieve inclusive goals such as poverty eradication, universal access to healthcare, education and other essential services (UNDESA, 2022), especially in developing country like Liberia.

6.3 Recommendations

Based on the findings from this thematic analysis, the following recommendations as suggested by Malhotra and colleagues (2011) are made for consideration:

6.3.1 Intensify public education to cause attitudinal change towards early childbearing

There is an urgent need to roll out a public advocacy and dissemination drive to stem the tide of early childbirth in Liberia. To effectively achieve this goal,

the Government should draw on the state news agency as well as private news outlets to disseminate information to the citizenry on why they should delay their births.

This public advocacy and education drive should target, among others, the youth, parents, community focal persons and opinion leaders, religious leaders, civil society groups and non-government organizations, and elected politicians at local levels. Efforts should also be made to build the capacity of relevant district and local administration officials; government ministries, departments and agencies especially Education, Gender, Children and Social Protection, and Health and Social Welfare, among others, for sectoral action in addressing the needs and concerns of young people in relation to pregnancy and childbirth. Local and national media channels need to be sensitized and empowered to conduct advocacy, raise awareness, and run educational campaigns to combat child and early marriages through their existing platforms. The organization leading the public education initiative should introduce age-appropriate and culturally sensitive life skills sessions. These sessions should cover topics such as sexual and reproductive health rights, gender equality, the significance of completing education, the value of acquiring vocational skills, and the advantages of delaying marriage and pregnancy.

To achieve this public education and advocacy goal, the Government can employ a mix of mechanisms, some of which include: (i) Community dialogues and meetings, (ii) Conversations with neighbours and friends, (iii) Meetings with traditional and religious leaders, (iv) Competitions and debates, (v) Theatre including plays, poetry, story-telling and singing, (vi) Mass media (rural radio, FM, TV, newspaper, etc.), (vii) Sports and games, (viii) Mobile voice messages, and, (ix) Social media platforms

6.3.2 Prioritize and strengthen measures to discourage early marriage and childbirth

With nearly 10 per cent (9.5) of adolescents having been in a marital union in the data from this current census, early marriage poses implications for adolescents' education and raises concerns about potential human rights violations. The Government of Liberia should prioritize and strengthen measures to discourage early marriage and childbirth,

emphasizing the importance of continued education for adolescents. Some of the strategies[1] that can be adopted in delaying or preventing child marriage include, but not limited to:

1) Empowering girls with information, skills and support networks

Girls should be empowered by way of training and capacity-building, skills acquisition, knowledge sharing, creating safe spaces and enabling support networks. These interventions; which will enable young girls to know themselves better, have a greater appreciation of the world and the options available to them, and fight for greater social and economic empowerment, thereby building their capacity to advocate for themselves and for others. Again, girls with greater human and social capital pursue alternatives to marriage e.g. jobs and social opportunities, thereby increasing their chances of success in life. This also influences how they are perceived by society; offering socially acceptable alternatives to child marriage which make the notion of child marriage more unpalatable over time, thereby leading to change in child marriage norms.

Some interventions that can be considered include: (i) Life skills training aimed at educating girls on various topics such as health, nutrition, financial management, legal awareness, effective communication, negotiation skills, decision-making and other pertinent subjects. (ii) Vocational and livelihoods skills training designed to equip girls with the necessary skills for engaging in income-generating activities and pursuing sustainable livelihoods. (iii) Sexual and reproductive health education programmes focused on providing girls with comprehensive knowledge about reproductive health, contraception, sexually transmitted infections and healthy relationships. (iv) Information, education and communication campaigns aimed at raising awareness about critical issues such as child marriage, the importance of education, human rights, reproductive health and related topics. (v) Mentoring and peer group training initiatives targeting youth leaders, adults, teachers and other influential figures to provide ongoing support, guidance and information to girls within their communities. (vi) Establishment of "safe spaces" or forums, clubs, and meetings where girls can gather, interact, share experiences and socialize in a safe and supportive environment outside of their homes.

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1   Malhotra, A., Warner, A., McGonagle, A., and Lee-Rife, S., (2011). Solutions to End Child Marriage: What the Evidence Shows. Washington: International Center for Research on Women.

2) Providing economic support and incentives to girls and their families

A key factor that contributes to high child marriage rates is poverty and access to income-generating activities for girls and their families. There is therefore the need to address the economic deprivation that forces families to give girls away in marriage. Economic empowerment will delay child marriage and increase the value and contribution of daughters to the home. Some ways of providing economic support and incentives to girls and their families include: (i) Direct cash transfers to increase economic security and chances for upward mobility for families, thereby reducing the economic and social pressure to marry a girl off. Some conditions for accessing these financial incentives should include requirements for educational investment in girls, and not to marry girls off till age 18, (ii) Microfinance and related training to support income generation by adolescent girls. Microfinance training – credit and savings – together with training in basic business skills e.g. agriculture, craftsmanship, tailoring and sewing, and finance and banking to assist girls support themselves and their families, and, (iii) Cash and non-cash incentives, subsidies, loans and scholarships to families or girls.

3) Educating and mobilizing parents and community members

It is important to engage parents and the community in general in ending child marriage since the decision to marry girls off is predominantly in the hands of the family, with tacit support of the community through cultural norms which support child marriage. Most often than not girls lack the power to decide when or whom to marry. Educating parents and mobilizing communities to transform social norms supporting child marriage is crucial. This can involve: (i) Conducting one-on-one meetings with parents, community leaders and religious figures to garner support for change. (ii) Organizing group and community educational sessions to discuss the repercussions of child marriage and explore alternative options. (iii) Establishing parental and adult committees and forums to guide life skills and sexual and reproductive health education initiatives. (iv) Implementing information, education and communication campaigns across various platforms to disseminate messages on child marriage, education, rights, reproductive health and related subjects. (v) Encouraging influential leaders, family heads, and community members to make public announcements and pledges supporting efforts to combat child marriage and promote positive social norms.

4) Enhancing girls' access to a high-quality education

Research indicates girls' education to be significantly associated with delayed marriage. School insulates children from early marriage for at least two reasons. First, simply being in school makes girls to be seen as children, and therefore not ready for marriage. Schools therefore serve as 'safe spaces' for girls, thereby becoming socially acceptable alternatives to getting married early. Second, school experience and content allow girls to develop social networks and acquire skills and information that shape girls' capacity to be able to effectively communicate and negotiate their interests. The return on human capital investment in girls i.e. the economic benefits of sending, and making girls remain in school, become more visible to parents and society when the girls begin to work and earn income. Efforts should therefore be made to employ formal schooling as a means to delay marriage. This can involve interventions such as: (i) Equipping and supporting girls to enrol or re-enrol in school through preparation and training programs. (ii) Enhancing school curricula and providing teacher training on essential topics like life skills, sexual and reproductive health, HIV/AIDS, and gender sensitivity. (iii) Constructing schools, enhancing infrastructure (especially for girls), and recruiting female educators. (iv) Offering financial incentives such as cash, scholarships, fee waivers, uniforms, and supplies to encourage girls' enrolment and retention in school. (v) Implementing educational policies that support the continued education of adolescent girls, even after pregnancy, within the education sector.

5) Encouraging supportive laws and policies

Liberia, like many other countries, has laws prohibiting child marriage. That notwithstanding, the practice has still subsisted. Enforcement of these laws however has still not achieved complete prevention of the practice, as evidenced by the prevalence rate observed in the data. It becomes imperative to strengthen enforcement and policy efforts to stem the tide in the practice of child marriage and further eliminate it. To further promote enforcement and achieve enhanced results, the following range of interventions can be considered: (i) Prosecuting defaulting parents who give their underage daughters away in marriage, and, (ii) Advocacy among community members and government officials on enforcement of existing laws/policies.

6.3.3 Provision of evidence-based information and public education on the risks of late childbirth

The study also found a moderately high prevalence rate of childbirth at older ages among women. Pregnancy and childbirth are risky for women who give birth in their later years. To address this situation, it is recommended that Government intensifies public education to inform people on the risks of late childbirth. In addition, women should be provided with evidence-based information to support their procreation choices at older ages and minimize risks associated with pregnancy in old age.

6.3.4 Improve on the civil registration and vital statistics

In the context of Liberia, reliance on nationally representative household censuses and sample surveys for fertility estimates is a consequence of an incomplete civil registration and vital statistics (CRVS) system. These estimates lack comparability to those derived from a fully functional CRVS, which is crucial for providing monthly vital statistics for specific geographic areas and population subgroups. Available census and sample survey data are often outdated by several years, limiting their timeliness and accuracy (Phillips, Adair, 2018). The Government of Liberia should prioritize the development of a comprehensive CRVS system capable of recording vital events, particularly births and deaths. Enhancing birth registration aligns with the primary development indicator of achieving SDG target 16.9, ensuring legal identity for all, including birth registration. Notably, with an 80 per cent increase in health facility deliveries in Liberia, recent births can be utilized to validate census findings.

The World Health Organization (WHO)'s CRVS strategic implementation plan for 2021-2025 proposes a framework to enhance the quality of birth statistics. This involves strengthening coordination between the health sector and CRVS stakeholders, improving vital event notification, integrating it into the civil registration system, and enhancing the reporting, production and dissemination of vital statistics. Births compiled and consolidated in a well-functioning CRVS offer a reliable foundation to monitor changes in fertility levels, assess FP initiatives and serve as a crucial indicator for child and maternal health. This is pivotal for health and social development. For Liberia to attain accurate fertility estimates, maintaining a universal and effective civil registration system is imperative.

6.3.5 The next population census

Given that the previous Liberian census occurred in 2008, representing a 14-year interval before the 2022 Liberian PHC, it is less preferable to compare old and new estimates due to the wide time gap. Consequently, it is recommended that the next PHC be scheduled for 2032. Conducting a census at regular intervals, ideally every 10 years, facilitates the comparison of events in a fixed sequence. This approach allows for the assessment of the past, description of the present and estimation of future trends.

Further, supplementary questions should be included in the census specifically addressing the place of delivery and the service provider during the last birth. Incorporating such questions holds significant potential for acquiring comprehensive insights into women's childbirth experiences at the national level.

Chapter 7: Generation of variables

7.1 Socioeconomic status (wealth) index

The wealth status of a household can be a reflection of its income, consumption and expenditure. However, obtaining accurate income and consumption data from household surveys can be resource intensive. To overcome this challenge, PCA was employed as a proxy methodology for measuring household socioeconomic status using household assets.

PCA is a multivariate statistical technique that reduces variables in a data set into a smaller number of dimensions. In mathematical terms, from an initial set of n correlated variables, PCA creates uncorrelated indices or components, where each component is a linear weighted combination of the initial variables. For example, from a set of variables X_1 through to X_n,

$$PC1 = {}_{a11}X_1 + {}_{a12}X_2 + \cdots + {}_{a1n}X_n$$

$$PC_m = {}_{am1}X_1 + {}_{am2}X_2 + \cdots + {}_{amn}X_n$$

where a_{mn} represents the weight for the *m*th principal component and the *n*th variable.

The socioeconomic status index derived from the PCA provides a composite measure of a household's cumulative living standard. It evaluates households based on their welfare status and employs a scoring formula to determine their economic status using physical and functional assets. These assets include dwelling ownership, electronic equipment, furniture, land, vehicles, and modern agricultural tools (number of rooms, tv, radio, refrigerator, fridge, pipe facility, toilet facility, electricity, car, motor, outboard motor, etc.) to mention a few.

PCA emphasizes variation and identifies strong patterns in the dataset by transforming observations of possibly correlated variables into linearly uncorrelated variables known as principal components. This transformation maximizes the variance captured by the first principal component, followed by subsequent components.

The methodology for computing the wealth status index involves assigning weight or factor scores to each household asset through PCA. These scores are standardized to a standard normal distribution, allowing for the creation of breakpoints of five equal-sized groups defining poverty levels: Poorest, Poorer, Middle, Richer and Richest. The creation of this index or grouping stemmed from the data obtained from the 2022 LPHC. This data forms the foundation for classifying households into wealth quintiles.

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Appendix

Table A1: ASFRs by place of residence

	Age Specific Fertility Rates							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	TFR
Liberia	76.2	128.3	163.5	137.2	125.8	103.2	37.4	3.9
Residence								
Urban	60.4	123.6	152.4	138.8	127.0	98.6	35.8	3.7
Rural	98.1	137.4	177.9	129.3	122.1	105.8	38.4	4.0
County								
Bomi	101.4	134.0	146.4	119.3	122.9	92.3	33.6	3.8
Bong	90.2	126.7	169.0	134.0	123.7	102.8	37.3	3.9
Gbarpolu	104.9	133.1	159.9	123.0	135.2	116.8	42.2	4.1
Grand Bassa	95.7	128.8	171.8	139.9	110.4	90.7	33.1	3.9
Grand Cape Mount	86.1	108.9	141.8	110.3	128.4	107.2	38.8	3.6
Grand Gedeh	62.2	110.8	158.8	130.4	124.8	106.1	38.4	3.7
Grand Kru	96.3	135.5	196.9	143.8	134.3	126.7	45.6	4.4
Lofa	74.5	130.9	174.1	142.4	111.2	85.7	31.3	3.8
Margibi	72.9	124.0	154.7	136.1	124.5	96.5	35.1	3.7
Maryland	74.5	136.8	205.4	176.3	130.1	121.6	43.8	4.4
Montserrado	56.8	122.0	148.5	134.0	123.5	96.4	35.1	3.6
Nimba	104.8	158.0	198.4	142.1	120.2	108.3	39.2	4.4
River Cess	140.3	163.3	219.7	128.8	114.3	135.8	48.7	4.8
River Gee	75.1	135.4	189.3	141.0	148.2	137.3	49.2	4.4
Sinoe	93.7	134.4	170.0	132.8	127.3	109.3	39.6	4.0

Table A2: ASFR by sociodemographic characteristics

	Age Specific Fertility Rates							
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	TFR
Literacy								
No	99.77	126.75	173.88	130.26	123.27	107.69	39.01	4.0
Yes	65.01	126.34	151.33	135.00	122.45	91.38	33.29	3.6
Education								
No Formal	100.5	133.7	173.5	129.9	120.0	106.1	38.5	4.0
Primary	76.3	163.4	169.3	135.4	126.4	101.1	36.7	4.0
Secondary +	55.0	109.0	143.8	131.2	119.8	85.4	31.2	3.4
Marital Status								
Never married	50.38	96.77	122.63	114.55	112.95	81.54	29.81	3.0
Consensual	178.70	85.62	195.83	123.62	152.55	122.04	43.97	4.5
Married - Monogamous	243.00	59.90	186.16	93.68	139.01	120.25	43.35	4.4
Married - Polygamous	227.58	63.16	185.64	92.65	148.04	138.52	49.59	4.5
Separated	182.56	70.61	152.21	98.42	119.94	98.46	35.78	3.8
Divorced	152.55	114.77	135.38	108.91	118.13	79.95	29.24	3.7
Widowed	130.92	96.72	203.78	135.92	103.19	115.99	41.89	4.1

Table A3: Parity distribution

	Women		Parity									
			0	1	2	3	4	5	6	7	8	9+
Liberia												
15-19	322,844	100	88.6	8.5	2.4	0.5	-	-	-	-	-	-
20-24	305,640	100	60.8	20.0	12.5	4.2	2.5	-	-	-	-	-
25-29	227,432	100	39.3	18.4	19.7	11.0	7.5	3.0	1.1	-	-	-
30-34	218,837	100	29.0	12.4	18.7	13.9	11.8	6.5	4.9	2.1	0.7	-
35-39	167,434	100	24.7	7.9	14.9	14.2	13.9	9.9	7.9	4.4	2.3	-
40-44	140,960	100	21.2	5.8	11.5	12.2	13.6	10.5	9.1	5.9	5.3	4.7
45-49	85,783	100	21.0	4.7	9.2	10.6	12.5	10.8	9.8	6.7	6.6	8.0
Total	1,468,930		48.6	12.5	12.3	8.2	7.0	4.2	3.3	1.8	1.3	0.9
Urban												
15-19	91,710	100	91.6	6.5	1.6	0.3	-	-	-	-	-	-
20-24	178,560	100	63.7	20.7	10.7	3.1	1.9	-	-	-	-	-
25-29	137,178	100	40.1	21.6	20.0	9.4	6.1	2.0	0.8	-	-	-
30-34	124,568	100	28.6	14.7	20.8	14.1	10.9	5.1	3.9	1.4	0.6	-
35-39	92,085	100	23.1	9.3	17.4	15.5	14.2	8.9	6.7	3.2	1.7	-
40-44	72,198	100	20.0	6.7	13.2	13.8	14.7	10.4	8.5	4.9	4.4	3.5
45-49	44,256	100	19.3	5.4	10.7	12.1	13.9	11.2	9.6	5.9	5.7	6.2
Total	840,555		50.5	13.5	12.6	7.9	6.6	3.5	2.7	1.3	1.0	0.6
Rural												
15-19	131,134	100	84.3	11.3	3.6	0.8	-	-	-	-	-	-
20-24	127,080	100	56.8	19.0	15.0	5.9	3.3	-	-	-	-	-
25-29	90,254	100	38.2	13.5	19.3	13.4	9.6	4.5	1.5	-	-	-
30-34	94,269	100	29.4	9.3	15.9	13.6	12.9	8.4	6.3	3.1	0.9	-
35-39	75,349	100	26.7	6.1	11.9	12.6	13.4	11.0	9.4	5.9	3.0	-
40-44	68,762	100	22.5	4.9	9.8	10.6	12.4	10.7	9.7	7.0	6.3	6.0
45-49	41,527	100	22.7	4.0	7.6	9.1	11.1	10.3	10.0	7.6	7.5	1.0
Total	628,375		46.7	11.1	11.9	8.6	7.7	5.1	4.0	2.4	1.7	0.7

Table A4: WPP 2021 – Regional reproduction rates

Region	Country	CBR	NNR	NAC	ABR	TFR
Region	**Western Africa**	**36.1**	**2.01**	**29.3**	2308.0	4.98
Region	**Eastern Africa**	**33.2**	**1.9**	**28.9**	2457.0	4.24
Region	**Middle Africa**	**39.9**	**2.4**	**29.4**	1179.0	5.62
Region	**Southern Africa**	**20.5**	**1.12**	**27.8**	170.0	2.45
Region	**Northern Africa**	**23.2**	**1.44**	**29.1**	456.0	3.07
Region	**Asia**	**14.3**	**0.90**	28.1	**4419.3**	1.94
Region	**Europe**	**9.2**	**0.71**	30.1	**203.5**	1.48
Region	**North America**	**10.9**	**0.79**	29.7	**178.9**	1.64
Region	**Oceana**	**15.6**	**1.01**	29.9	**40.7**	2.15
Country	Benin	36.6	2.09	29.1	61.7	4.97
Country	Burkina Faso	35.5	2.01	28.9	131.1	4.77
Country	Côte d'Ivoire	33.9	1.91	28.9	158.8	4.42
Country	Gambia	33.3	2.04	30.4	9.1	4.68
Country	Ghana	27.5	1.58	29.6	106.3	3.56
Country	Guinea	34.4	1.82	28.9	82.9	4.40
Country	Guinea-Bissau	31.1	1.73	29.5	9.8	4.01
Country	**Liberia**	**32.3**	**1.63**	**28.8**	**76.2**	**3.85**
Country	Mali	41.6	2.51	28.9	179.6	5.96
Country	Mauritania	33.2	1.98	29.9	20.0	4.40
Country	Niger	45.3	2.94	29.1	228.3	6.82
Country	Nigeria	37.1	1.98	29.5	1144.1	5.24
Country	Senegal	32.6	2.03	30.1	59.4	4.39
Country	Sierra Leone	31.4	1.69	28.7	46.1	3.98
Country	Togo	31.9	1.83	29.1	34.7	4.26

Source: LPHC 2022, WPP 2021

Table 12: Life expectancy, urban females

Age x	nMx	nqx	lx	Ndx	nLx	5Px	Tx	ex
0	0.072	0.067	100000	6681	93319	0.922	5911142	59.1
1-4	0.008	0.030	93319	2777	367722	0.977	5817823	62.3
5-9	0.002	0.011	90542	956	450321	0.991	5450101	60.2
10-14	0.002	0.008	89586	713	446150	0.990	4999780	55.8
15-19	0.002	0.012	88873	1026	441801	0.986	4553630	51.2
20-24	0.003	0.016	87847	1400	435735	0.983	4111829	46.8
25-29	0.004	0.018	86447	1593	428252	0.981	3676095	42.5
30-34	0.004	0.020	84854	1729	419946	0.978	3247843	38.3
35-39	0.005	0.024	83125	1973	410691	0.972	2827897	34.0
40-44	0.007	0.033	81152	2658	399114	0.963	2417206	29.8
45-49	0.008	0.041	78494	3208	384450	0.949	2018092	25.7
40-54	0.013	0.061	75286	4588	364961	0.929	1633642	21.7
55-59	0.017	0.082	70698	5813	338959	0.895	1268681	17.9
60-64	0.028	0.131	64886	8468	303259	0.831	929721	14.3
65-69	0.048	0.214	56418	12085	251877	0.726	626463	11.1
70-74	0.085	0.350	44333	15533	182830	0.568	374586	8.4
75-79	0.155	0.558	28799	16059	103849	0.458	191756	6.7
80+	0.145	1.000	12740	12740	87907		87907	6.9

Table 13: Life expectancy, rural females

Age x	nMx	nqx	lx	Ndx	nLx	5Px	Tx	ex
0	0.086	0.079	100000	7919	92081	0.905	5578969	55.8
1-4	0.011	0.044	92081	4009	360305	0.964	5486889	59.6
5-9	0.004	0.019	88072	1681	436157	0.984	5126584	58.2
10-14	0.002	0.012	86391	1061	429303	0.986	4690427	54.3
15-19	0.003	0.016	85330	1336	423310	0.982	4261124	49.9
20-24	0.004	0.020	83994	1695	415731	0.978	3837815	45.7
25-29	0.005	0.023	82298	1925	406679	0.975	3422084	41.6
30-34	0.005	0.026	80373	2117	396573	0.972	3015405	37.5
35-39	0.006	0.031	78256	2388	385310	0.965	2618832	33.5
40-44	0.008	0.039	75868	2946	371976	0.957	2233522	29.4
45-49	0.009	0.046	72922	3378	356167	0.945	1861546	25.5
40-54	0.013	0.065	69545	4525	336410	0.924	1505379	21.6
55-59	0.018	0.087	65019	5679	310901	0.890	1168969	18.0
60-64	0.029	0.135	59341	7984	276745	0.828	858068	14.5
65-69	0.048	0.214	51357	11002	229280	0.730	581323	11.3
70-74	0.082	0.340	40355	13727	167457	0.587	352043	8.7
75-79	0.142	0.523	26628	13938	98294	0.467	184587	6.9
80+	0.147	1.000	12690	12690	86292		86292	6.8