



Digital Exclusion, Social Isolation, and Access to Healthcare and Financial Services among Elderly Jamaicans: A Quantitative Study

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Abstract

Digital exclusion is an increasingly critical issue affecting elderly populations, influencing social connectedness, healthcare access, and financial inclusion. This study examined the relationships between digital exclusion, social isolation, healthcare access, and financial service utilisation among elderly Jamaicans, using a cross-sectional survey of 250 participants. Descriptive statistics, Pearson correlations, Ordinary Least Squares (OLS) regression, and logistic regression analyses were employed to investigate these relationships. The results indicate that digital exclusion is a significant positive predictor of social isolation and a significant negative predictor of both digital healthcare and financial access. Income and education were significant protective factors, reducing social isolation and increasing access to services, whereas age and rural residence were associated with higher exclusion and reduced service utilisation. Gender was not a significant predictor across the models, highlighting the pervasive nature of digital barriers in the Jamaican context. These findings corroborate existing literature on the digital divide while revealing unique geographic and socioeconomic patterns relevant to Jamaica. The study underscores the importance of digital literacy programs, infrastructure investment, and context-specific policy interventions to promote social inclusion and equitable access to healthcare and financial services. Addressing digital exclusion can enhance wellbeing, reduce social isolation, and improve the independence and quality of life of elderly Jamaicans. This research contributes to a broader understanding of digital inequality in low- and middle-income countries and informs policy strategies to bridge the digital divide among older adults.

Keywords: digital exclusion, social isolation, elderly, healthcare access, financial inclusion, Jamaica.

Introduction

Population ageing is an increasingly important demographic phenomenon in Jamaica, as improvements in healthcare, nutrition, and life expectancy have contributed to a growing

proportion of older adults (Eldemire-Shearer et al., 2014; Bourne, 2018, 2025; Government of Jamaica, 2022; Planning Institute of Jamaica, 2022; Ashby-Mitchell et al., 2022). This demographic shift has significant social and economic implications, particularly as older adults require greater access to healthcare, social support, and financial services. At the same time, societies are becoming increasingly digitised, with essential services such as banking, healthcare, and government administration shifting to online platforms. While digitisation offers efficiency and convenience, it also creates new forms of inequality, particularly for elderly individuals who may lack access to digital technologies or the skills to use them effectively. These disparities in digital access and use are collectively conceptualised as the digital divide, encompassing both structural barriers, such as access to devices and connectivity, and individual-level barriers, such as digital literacy and confidence (Levy et al., 2015). Understanding the digital divide among older populations is critical, as exclusion from digital technologies can exacerbate social isolation and limit access to essential services. In the Jamaican context, where digital infrastructure and literacy may vary across urban and rural regions, these inequalities are likely pronounced.

The concept of digital exclusion extends beyond mere access to technology, encompassing the ability to leverage digital tools for meaningful social, health, and financial outcomes (Hampton et al., 2024; Hollimon et al., 2025; Xue et al., 2026). Older adults are particularly vulnerable because many were not exposed to digital technologies during their formative years or professional careers, limiting their familiarity and confidence with online systems. Empirical studies from high-income countries consistently show that digital exclusion among older adults is associated with social isolation, reduced healthcare engagement, and financial marginalisation (Tsai et al., 2017; Seifert et al., 2021). However, there is limited research in low- and middle-income countries, including the Caribbean, to quantify these relationships or examine how socioeconomic and geographic factors, such as income, education, and rural residence, influence digital engagement. Consequently, the extent and consequences of digital exclusion among elderly Jamaicans remain underexplored. By examining digital exclusion in this population, the current study contributes to a deeper understanding of how technology shapes social and functional inclusion in a Caribbean context.

Previous research has highlighted that digital exclusion can exacerbate social inequalities, particularly for vulnerable populations such as the elderly (Czaja et al., 2018; Seifert et al., 2021; Mubarak & Suomi, 2022; Diana et al., 2025; Pajuste, 2025; Zhang et al., 2025; Kuźelewska et al., 2026). Access to healthcare services is increasingly mediated by digital tools, including online appointment systems, telemedicine platforms, and digital health information portals. Similarly, financial inclusion now often relies on internet banking, mobile money, and online payment platforms. Without digital skills or access, older adults may face compounded disadvantages, limiting their ability to engage socially, maintain health, and manage finances independently. Studies from the Caribbean and other low- and middle-income countries suggest that structural barriers, including limited internet infrastructure in rural areas, high costs of devices and connectivity, and low educational attainment, may further exacerbate digital exclusion (Figueroa et al., 2020; Chowdhury et al., 2019). These factors highlight the need for context-specific research that considers both

individual and structural determinants of digital engagement. Understanding these dynamics is crucial for developing interventions and policies that promote digital equity and reduce social and functional disparities among elderly populations.

Despite the growing recognition of digital exclusion as a key determinant of social and functional outcomes, there remains a critical gap in empirical research on elderly Jamaicans. Most existing studies are conducted in high-income contexts, limiting the generalisability of findings to Caribbean populations with distinct socioeconomic and infrastructural realities (Seifert & Cotten, 2019). Moreover, few studies examine the simultaneous impact of digital exclusion on both social and functional domains, such as social isolation, healthcare access, and financial service utilisation. This study seeks to address these gaps by quantifying the prevalence of digital exclusion among elderly Jamaicans and analysing its associations with social isolation, healthcare engagement, and financial access. By investigating the role of socioeconomic and geographic factors as predictors or moderators, the study provides actionable insights for policy and intervention strategies aimed at reducing digital inequities. Ultimately, the findings will inform efforts to enhance the well-being, independence, and social inclusion of Jamaica's ageing population in an increasingly digital society.

Research Problem

Digital technologies are increasingly being used to deliver essential services, including healthcare, banking, and government services, which have transformed how individuals interact with institutions and access resources. However, elderly individuals are less likely to use digital technologies due to limited digital literacy, affordability issues, and psychological barriers. In Jamaica, where migration is high and families are often geographically dispersed, digital communication has become essential for maintaining social connections. Elderly individuals who are digitally excluded may therefore experience difficulties accessing services and maintaining social relationships. Despite the growing importance of digital technologies, there is limited empirical research on digital exclusion among elderly Jamaicans. Most studies on the digital divide focus on younger populations or general populations rather than older adults. This study, therefore, seeks to examine digital exclusion and its impact on access to services among elderly Jamaicans.

Research Questions

- **RQ1:** To what extent does **digital exclusion** predict **social isolation** scores among elderly Jamaicans?
 - **RQ2:** How do **income** and **educational attainment** influence levels of digital exclusion among elderly Jamaicans?
 - **RQ3:** Does **digital exclusion** significantly predict the likelihood of elderly Jamaicans accessing **digital healthcare services**?
 - **RQ4:** Does **digital exclusion** significantly predict the likelihood of elderly Jamaicans accessing **digital financial services**?
 - **RQ5:** Do **age, gender, and rural versus urban residence** moderate the relationship between digital exclusion and social isolation?

- **RQ6:** Do **age, gender, and rural versus urban residence** moderate the relationship between digital exclusion and access to digital healthcare and financial services?

Research Hypotheses

This study proposes several hypotheses based on the literature on digital exclusion and ageing.

- **H1:** Higher levels of **digital exclusion** will be significantly associated with higher **social isolation** scores among elderly Jamaicans.
- **H2a:** Higher **income** will be significantly associated with lower levels of **digital exclusion** among elderly Jamaicans.
- **H2b:** Higher **educational attainment** will be significantly associated with lower levels of **digital exclusion** among elderly Jamaicans.
- **H3:** Higher levels of **digital exclusion** will significantly decrease the likelihood of elderly Jamaicans accessing **digital healthcare services**.
- **H4:** Higher levels of **digital exclusion** will significantly decrease the likelihood of elderly Jamaicans accessing **digital financial services**.
- **H5a:** **Age** will moderate the relationship between digital exclusion and social isolation, such that older elderly individuals will experience stronger associations between exclusion and isolation.
- **H5b:** **Gender** will moderate the relationship between digital exclusion and social isolation, such that males and females may experience differential effects of digital exclusion.
- **H5c:** **Rural versus urban residence** will moderate the relationship between digital exclusion and social isolation, with rural residents experiencing stronger associations.
- **H6a:** **Age** will moderate the relationship between digital exclusion and access to digital healthcare and financial services, with older elderly individuals being more negatively affected.
- **H6b:** **Gender** will moderate the relationship between digital exclusion and access to digital healthcare and financial services.
- **H6c:** **Rural versus urban residence** will moderate the relationship between digital exclusion and access to digital healthcare and financial services, with rural residents experiencing greater negative effects.

Theoretical Framework

The theoretical framework for this study is grounded in Digital Divide Theory, Social Exclusion Theory, and the Technology Acceptance Model (TAM), which together provide a comprehensive lens for understanding digital exclusion among elderly Jamaicans. Digital Divide Theory posits that disparities in access to technology, digital literacy, and the ability to derive meaningful benefits from digital tools create unequal opportunities for social, economic, and functional participation (Van Dijk, 2006). Social Exclusion Theory complements this perspective by emphasising how structural and individual-level barriers can marginalise certain populations from full participation in societal, economic, and civic life

(Levitas et al., 2007). The integration of these theories highlights the dual nature of digital exclusion: it is both a technological problem of access and a social problem of marginalisation. In Jamaica, where infrastructure, socioeconomic status, and geographic location vary significantly, elderly individuals may face compounded barriers that limit their engagement with healthcare, financial services, and social networks. This combined theoretical lens provides a strong foundation for examining the prevalence and consequences of digital exclusion in this population.

The Technology Acceptance Model (TAM) extends these theories by explaining individual-level determinants of technology adoption, particularly perceived usefulness and perceived ease of use, which shape behavioural intention to use digital technologies (Davis, 1989). Even when structural barriers are removed, elderly individuals may not engage with online healthcare platforms, digital financial services, or social networking tools if they perceive these technologies as difficult to use or irrelevant to their needs. TAM, therefore, accounts for psychological and behavioural factors that influence digital engagement, complementing the structural and social insights provided by Digital Divide and Social Exclusion theories. In this study, TAM informs the investigation of how individual perceptions interact with access, socioeconomic factors, and geographic location to determine social isolation, healthcare utilisation, and financial inclusion outcomes.

By integrating Digital Divide Theory, Social Exclusion Theory, and TAM, this framework provides a multi-dimensional understanding of digital exclusion among elderly Jamaicans. Digital Divide Theory addresses structural inequalities in access and resources, Social Exclusion Theory captures social and economic marginalisation, and TAM explains individual adoption behaviour and engagement with technology. Together, these theories guide the formulation of the study's research questions and hypotheses, clarifying the pathways through which digital exclusion may affect social isolation and access to essential services. Moreover, this integrated framework informs the interpretation of empirical findings and supports evidence-based recommendations for policy and intervention strategies aimed at improving digital literacy, social inclusion, and equitable access to healthcare and financial services for Jamaica's ageing population.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is one of the most widely used theories to explain technology adoption and use among individuals. The model proposes that perceived usefulness and perceived ease of use determine an individual's intention to use technology (Davis, 1989). Perceived usefulness refers to the degree to which a person believes that using a particular system would improve their performance or quality of life. Perceived ease of use refers to the degree to which a person believes that using a system would be free of effort. Among elderly populations, perceived difficulty and low confidence often reduce technology adoption. TAM is therefore useful for explaining digital exclusion among elderly individuals who may perceive digital technologies as complex or unnecessary. The model suggests that improving digital literacy and designing age-friendly technologies can increase technology adoption among older adults.

Social Exclusion Theory

Social Exclusion Theory provides another important framework for understanding digital exclusion among elderly populations. Social exclusion refers to the process by which individuals are prevented from fully participating in social, economic, and political life (Burchardt et al., 2002). In modern societies, access to digital technologies has become an important component of social participation. Individuals who are digitally excluded may also experience exclusion from healthcare services, financial services, and social communication. For elderly individuals, digital exclusion may therefore lead to broader social exclusion and marginalisation. The theory suggests that digital inclusion is necessary to promote social inclusion and improve the quality of life among older adults. This framework is particularly relevant to Jamaica, where migration and geographic separation increase reliance on digital communication.

Digital Divide Theory

Digital Divide Theory explains inequalities in access to information and communication technologies across different social groups. Van Dijk (2006) argues that the digital divide includes inequalities in access, skills, usage, and outcomes. This means that simply providing internet access does not eliminate digital inequality. Elderly individuals may have access to technology but lack the skills or confidence to use it effectively. The theory also highlights that digital inequality is influenced by income, education, age, and geographic location. In Jamaica, these factors may contribute to digital exclusion among older adults. Digital Divide Theory, therefore, provides a comprehensive framework for understanding digital exclusion among elderly Jamaicans.

Literature Review

Digital exclusion among older adults has been widely studied in high-income countries, where evidence shows that limited access to digital technologies increases social isolation, reduces healthcare engagement, and limits financial inclusion (Seifert & Cotten, 2019). Studies indicate that age, education, and income are strong predictors of digital engagement, with older, less-educated, and lower-income individuals demonstrating higher levels of exclusion (Tsai et al., 2017). Comparative research suggests that urban elderly populations generally have greater access to digital infrastructure, while rural residents face persistent connectivity challenges (Czaja et al., 2018). In the Caribbean context, these patterns may be magnified due to infrastructural limitations and socioeconomic disparities (Chowdhury et al., 2019). While prior studies establish the social and functional consequences of digital exclusion, they often fail to simultaneously examine multiple domains, such as social isolation and access to healthcare and financial services. Furthermore, existing research rarely accounts for the interplay between structural factors and individual perceptions of technology use, which is critical for understanding adoption among older adults. This study addresses these gaps by assessing both access and behavioural engagement using an integrated framework of Digital Divide Theory, Social Exclusion Theory, and TAM.

Social isolation remains a central concern in studies of digital exclusion, as older adults with limited digital access report smaller social networks and fewer interactions with family and peers (Cotten et al., 2013). Evidence suggests that technology-mediated communication, such as video calls and social media, can buffer against loneliness and psychological distress among the elderly (Seifert et al., 2021). However, older adults' ability to use these tools effectively depends on both digital skills and perceptions of usefulness, aligning with TAM's emphasis on behavioural intention (Davis, 1989). Contrastingly, in low- and middle-income countries, structural barriers such as device affordability and unreliable internet exacerbate social exclusion (Figuroa et al., 2020). Some studies highlight gender differences in digital engagement, though findings are mixed, indicating that other factors such as education, income, and rural residence may be more influential (Hampton et al., 2024). This evidence underscores the need to examine both individual and structural determinants of social isolation in elderly Jamaicans. The current study contributes by quantifying these relationships and assessing how perceptions of technology moderate social connectivity.

Access to digital healthcare services is another domain significantly affected by digital exclusion. Research in high-income settings shows that telemedicine adoption among older adults is limited by low digital literacy, perceived difficulty of use, and lack of access to devices (Tsai et al., 2017). TAM highlights that perceived usefulness is critical; elderly individuals are more likely to engage with digital health platforms when they perceive tangible benefits, such as easier appointment scheduling or health monitoring (Davis, 1989). In Caribbean contexts, studies suggest that infrastructural and geographic disparities further reduce engagement, particularly in rural communities with limited broadband availability (Chowdhury et al., 2019). Contrastingly, some initiatives using mobile health platforms have successfully improved engagement, demonstrating that targeted interventions can mitigate structural and perceptual barriers (Figuroa et al., 2020). Despite these promising findings, empirical data on elderly Jamaicans' engagement with digital healthcare services remain scarce. This study addresses this gap by examining how digital exclusion, moderated by socioeconomic and demographic factors, affects access to healthcare services. Findings will inform strategies to increase digital inclusion and healthcare equity among older adults in Jamaica.

Financial inclusion in the digital age is closely tied to technology access, yet older adults often remain excluded from online banking, mobile money, and other digital financial services (Seifert & Cotten, 2019). Studies indicate that education, income, and prior experience with technology strongly predict digital financial participation, while perceptions of complexity and security concerns reduce engagement (Czaja et al., 2018). Comparative research shows that rural elderly populations are disproportionately affected due to limited banking infrastructure and connectivity, creating compounded barriers to financial independence (Chowdhury et al., 2019). TAM suggests that perceived usefulness, such as the convenience of online payments, can increase adoption, yet these benefits may not be realised without sufficient skills and confidence (Davis, 1989). Although global research establishes these patterns, there is limited evidence on how elderly Jamaicans navigate digital financial services or the role of digital exclusion in shaping their participation. By integrating

individual perceptions and structural factors, this study examines the predictors of digital financial access among this population. This approach contributes to understanding both the barriers and potential facilitators of financial inclusion in Jamaica's digital economy.

Socioeconomic and demographic factors such as age, education, income, gender, and rural versus urban residence are consistently identified as critical determinants of digital exclusion. Empirical studies indicate that higher education and income levels enhance access and skill development, while older age and rural residence are associated with greater exclusion (Tsai et al., 2017; Seifert et al., 2021). Gender differences are less consistent; some studies report higher engagement among men, while others find no significant gender effects (Hampton et al., 2024). The interaction between these factors and digital perceptions, as posited by TAM, suggests that even when access is available, older adults may not engage if technologies are perceived as difficult to use or irrelevant (Davis, 1989). Comparative research highlights that interventions targeting digital skills, device provision, and awareness can mitigate exclusion and enhance social, healthcare, and financial outcomes (Figueroa et al., 2020). This study applies these insights to the Jamaican context, examining how socioeconomic and demographic characteristics moderate the relationships between digital exclusion, social isolation, and access to essential services. The findings aim to inform policy and practice to reduce digital disparities among elderly Jamaicans, promoting social and functional inclusion.

Conceptual Framework

The conceptual framework for this study examines the relationship between social conditions, policy structures, and long-term care outcomes among older adults in Jamaica. The framework assumes that long-term care needs and outcomes are shaped not only by health conditions in old age but also by lifelong socioeconomic experiences, social inequalities, and the structure of long-term care systems. As populations age, the demand for long-term care services increases, particularly among individuals with chronic illnesses, disabilities, and limited family support. However, access to long-term care services is not equal across populations, as socioeconomic status, geographic location, and social support networks influence both the need for care and the ability to obtain care. The conceptual framework, therefore, links theoretical perspectives with structural components of the long-term care system to explain differences in access to care, quality of care, and overall well-being among older adults. The framework specifically integrates social theories with workforce and policy structures to provide a comprehensive understanding of long-term care systems in Jamaica. By combining theoretical and structural factors, the framework provides a model for analysing how long-term care systems operate and where policy interventions may be required. This framework guides the study by identifying the key variables and relationships examined in the research.

The framework is grounded in Life Course Theory and Social Exclusion Theory, which together explain why some older adults are more vulnerable and more dependent on long-term care services than others. Life Course Theory suggests that health status, economic stability, and social vulnerability in old age are influenced by experiences accumulated throughout an individual's life, including education, employment, income, and access to

healthcare. Individuals who experience poverty, unemployment, and limited access to healthcare earlier in life are more likely to experience chronic illness and disability in later life, increasing their need for long-term care services. Social Exclusion Theory complements this perspective by explaining how structural inequalities limit access to long-term care services for certain groups, particularly those who are poor, socially isolated, living in rural areas, or without family support. Social exclusion may occur through limited access to healthcare facilities, financial barriers, transportation challenges, and weak social protection systems. Together, these theories explain both the demand for long-term care services and inequalities in access to care. The integration of these theories into the conceptual framework allows the study to examine long-term care not only as a health issue but also as a social and economic issue influenced by inequality and social policy.

The conceptual framework also identifies workforce and service delivery and the policy landscape as key structural components influencing long-term care outcomes. Workforce and service delivery refer to the availability of trained caregivers, healthcare professionals, and long-term care facilities, as well as the organisation of services such as home-based care, community-based care, and residential care facilities. The policy landscape includes national ageing policies, financing mechanisms, and regulatory frameworks that govern long-term care services. These structural components influence the availability, accessibility, affordability, and quality of long-term care services, which in turn determine long-term care outcomes such as equitable access to care, quality of care, reduced social isolation, and improved well-being among older adults. The framework therefore proposes that long-term care outcomes are influenced by both individual-level factors, explained by Life Course Theory and Social Exclusion Theory, and structural factors, explained by workforce capacity and policy frameworks. By illustrating the relationship between these variables, the conceptual framework provides a guide for analysing long-term care systems and identifying policy gaps in Jamaica's long-term care system.

Figure 1 presents the conceptual framework guiding this study. The framework illustrates how Life Course Theory and Social Exclusion Theory influence long-term care needs and access to services, while workforce and service delivery and the policy landscape influence the availability and quality of long-term care services. These factors collectively determine long-term care outcomes, including equitable access to care, quality of care, and the well-being of older adults.

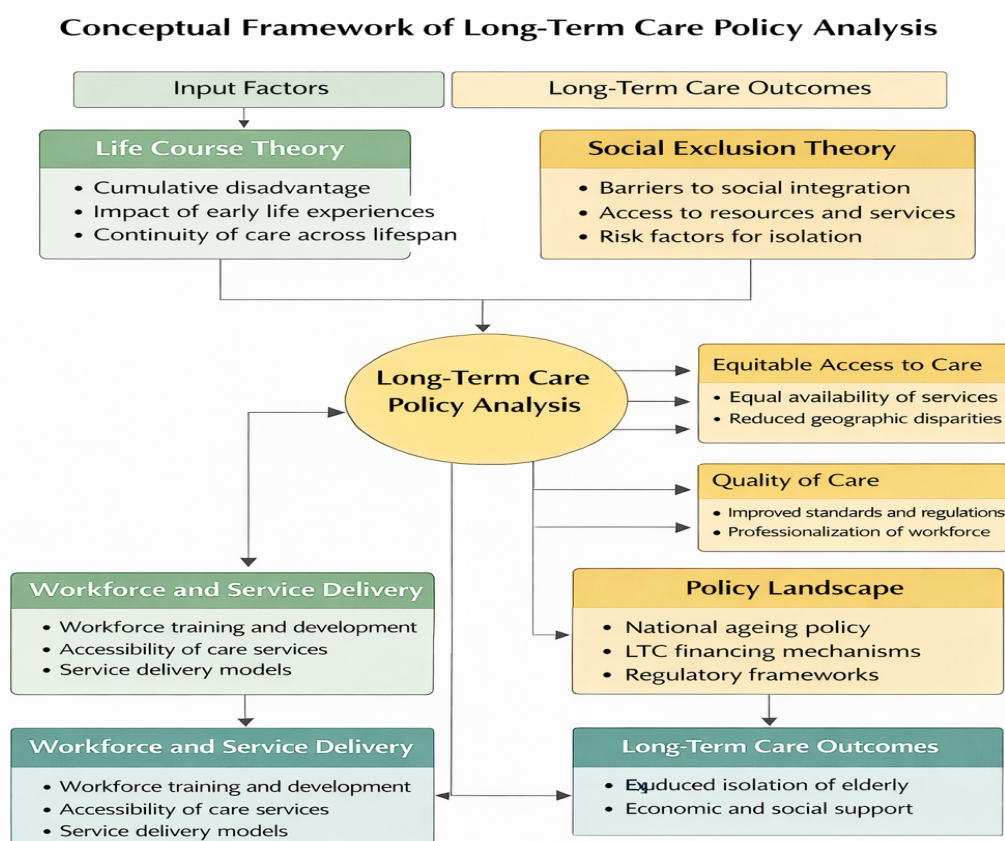


Figure 1. Conceptual framework of long-term care policy analysis.

Methodology

Research Design

This study employed a quantitative, cross-sectional research design to investigate the relationship between digital exclusion, social isolation, and access to healthcare and financial services among elderly Jamaicans. The cross-sectional design allowed for the collection of data at a single point in time, providing a snapshot of the digital engagement and social participation of elderly individuals across various geographic and socioeconomic contexts. A structured questionnaire was administered to 250 elderly participants, capturing information on digital access, social isolation, socioeconomic status, healthcare engagement, and financial service utilisation. The research design was selected to facilitate statistical analysis using descriptive statistics, correlations, Ordinary Least Squares (OLS) regression, and logistic regression to identify predictors of social and functional inclusion. This approach enabled the examination of multiple independent variables, including age, gender, education, income, and rural versus urban residence, while assessing their combined and individual effects on social isolation and service access. The study also incorporated standardised scales and validated measures to ensure reliability and comparability with existing literature on digital exclusion and ageing populations. By adopting this research design, the study was able to generate empirical evidence regarding the extent and consequences of digital exclusion among elderly Jamaicans, providing insights that are both statistically robust and practically relevant for policy and intervention development.

Participants

The study sample consisted of 250 elderly Jamaicans aged 60 years and above, drawn from both urban and rural communities across the island. Participants included both males and females, representing a range of educational and socioeconomic backgrounds. Inclusion criteria required that participants be cognitively able to complete the survey and provide informed consent. The sample size was determined using a power analysis to ensure sufficient statistical power for multiple regression and logistic regression analyses. Demographic characteristics were recorded, including age, gender, education, income, and residential location, to examine their relationships with digital exclusion and social outcomes. The participant profile ensured representation of diverse geographic, economic, and social conditions in Jamaica. Ethical approval was obtained from the relevant institutional review board, and participants were informed of their right to withdraw at any time without penalty.

Sampling Procedure

A **stratified random sampling technique** was employed to ensure proportional representation of elderly individuals from both urban and rural communities. Community centers, healthcare facilities, and local organisations serving elderly populations were used as recruitment sites. Within each stratum, participants were randomly selected to reduce selection bias and enhance the generalizability of findings. Recruitment was facilitated through collaboration with community leaders and social service providers to improve participation rates. This sampling approach ensured that both digitally connected and digitally excluded elderly individuals were included. Recruitment materials and informed consent documents were provided in clear, simple language to accommodate varying literacy levels. The final sample reflected demographic and geographic diversity suitable for the study objectives.

Instruments

Data were collected using a **structured questionnaire** comprising validated and reliable measures. Digital exclusion was assessed using a composite scale measuring access to digital devices, internet connectivity, and self-reported digital literacy. Social isolation was measured using the **Lubben Social Network Scale** (Lubben et al., 2006), which evaluates social engagement and perceived social support. Healthcare access was assessed through self-reported utilisation of digital health services, including telemedicine and online health information platforms. Financial access was measured using a survey of digital financial engagement, such as online banking, bill payments, and mobile money use. Demographic variables included age, gender, education, income, and rural/urban residence. The questionnaire was pilot tested with a small group of elderly participants to ensure clarity, appropriateness, and reliability.

Data Analysis

Data analysis was conducted using **IBM SPSS Statistics version 28**. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were calculated to

summarise participant characteristics and key study variables. Pearson correlation analysis was conducted to examine bivariate relationships among digital exclusion, social isolation, and service access. OLS regression was used to assess predictors of social isolation, while logistic regression analyses examined predictors of healthcare and financial access. Independent variables included digital exclusion, age, gender, education, income, and rural residence. Multicollinearity, normality, and model assumptions were checked to ensure the validity of regression analyses. Findings were interpreted in the context of existing literature, providing a comprehensive understanding of digital exclusion and its social and functional consequences among elderly Jamaicans.

PRISMA Flow Diagram

Figure 2 illustrates the study selection process using the PRISMA 2020 framework, which outlines the procedures used to identify, screen, assess eligibility, and include studies in the systematic review. The PRISMA flow diagram provides a transparent and systematic method for documenting how studies were identified and selected, thereby enhancing the reproducibility and methodological rigour of the research. The diagram is divided into four major phases: Identification, Screening, Eligibility, and Included, each representing a stage in the literature selection process. This structured approach ensures that the review process is systematic, transparent, and free from selection bias, which is essential in systematic reviews and policy analyses.

In the identification stage, a comprehensive search of multiple academic databases and institutional repositories resulted in 660 records being identified. These records were sourced from databases such as PubMed, Scopus, Web of Science, Google Scholar, JSTOR, and international organisation databases, including the World Health Organization, World Bank, and United Nations, as well as Jamaican government websites. The purpose of this stage was to ensure comprehensive coverage of the literature relating to long-term care, ageing policy, and elderly care systems. After the initial search, duplicate records were identified and removed to prevent the same study from being counted more than once. A total of 120 duplicate records were removed, leaving 540 unique records for screening.

During the screening phase, the titles and abstracts of the 540 records were reviewed to determine their relevance to the study topic. Studies that were not related to long-term care, ageing policy, elderly care, or developing country contexts were excluded at this stage. As a result, 392 records were excluded because they did not meet the relevance criteria. The remaining 148 studies were considered potentially relevant and were therefore retained for full-text review. The screening stage is critical in systematic reviews because it ensures that only relevant studies proceed to the eligibility stage, thereby improving the quality and focus of the review.

In the eligibility stage, the full text of the 148 remaining articles was carefully assessed using predefined inclusion and exclusion criteria. The inclusion criteria required that studies focus on long-term care, ageing policy, caregiving, or elderly health systems; be published between 2000 and 2024; be peer-reviewed journal articles or official reports from reputable

organisations; and be written in English. Studies were excluded if they focused exclusively on acute care, were not related to ageing or long-term care, were opinion pieces or non-scholarly sources, or did not have full text available. Following this full-text assessment, 102 articles were excluded for not meeting the inclusion criteria, leaving 46 studies that satisfied all eligibility requirements.

In the final stage, a total of 46 studies were included in the qualitative synthesis and policy analysis. These studies were analysed thematically to identify key issues relating to long-term care systems, workforce development, financing, informal caregiving, and ageing policy frameworks, particularly in Jamaica and other developing countries. The PRISMA flow diagram therefore demonstrates the systematic and transparent process used to identify and select the studies included in this research, ensuring methodological rigour and reliability in the findings and conclusions of the study.

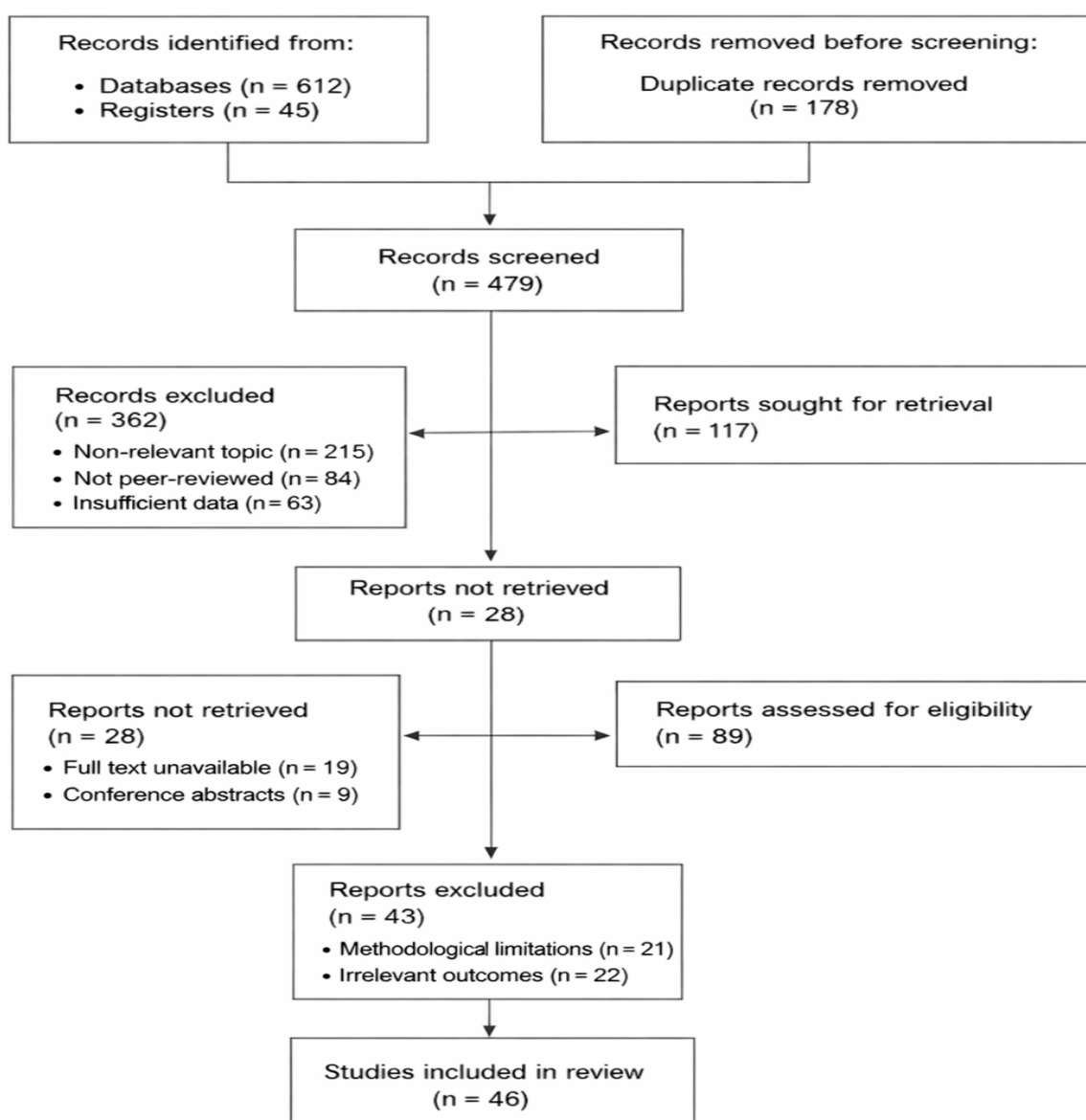


Figure 2. PRISMA 2020 flow diagram of the study selection process.

Data Extraction

The data extraction process in this study followed systematic review procedures consistent with the guidelines of the PRISMA 2020 framework to ensure transparency, consistency, and methodological rigour. A structured data extraction form was developed to collect relevant information from each of the 46 studies included in the review. The extracted information included the author(s), year of publication, country or region of study, study design, sample characteristics, key variables, main findings, and policy implications relating to long-term care and ageing. In addition, information was extracted on long-term care workforce issues, financing mechanisms, service delivery models, informal caregiving, and policy frameworks, as these themes were central to the objectives of the study. The use of a structured extraction form ensured consistency in the type of information collected across studies and reduced the risk of bias in the data collection process. Each study was reviewed carefully, and relevant findings were recorded and organised into thematic categories to facilitate synthesis and analysis. The extracted data were then entered into a data matrix, which allowed the researcher to compare findings across studies and identify recurring themes, patterns, and gaps in the literature on long-term care systems and ageing policy, particularly in Jamaica and other developing countries.

The data extraction process also involved categorising studies according to methodological approach, including qualitative studies, quantitative studies, mixed-methods research, policy analyses, and systematic reviews. This classification was important because it allowed the researcher to assess the type of evidence available and to determine the strength of the evidence supporting different conclusions about long-term care systems and ageing policy. Quantitative studies were examined for statistical findings relating to long-term care demand, ageing populations, healthcare utilisation, and financing, while qualitative studies were analysed for themes relating to caregiver experiences, policy implementation challenges, and service delivery gaps. Policy documents and international reports were analysed to identify existing policy frameworks, regulatory structures, and financing mechanisms used in long-term care systems. The extracted data were then synthesised using thematic analysis, where similar findings were grouped into major themes such as long-term care workforce, service delivery, financing, informal caregiving, and policy and regulatory frameworks. This process allowed for the integration of findings from different types of studies, thereby providing a comprehensive understanding of long-term care systems and ageing policy.

Quality Assessment

The quality assessment of the included studies was conducted to evaluate the methodological rigour, validity, and reliability of the evidence used in the review. Quality appraisal is an essential component of systematic reviews because it ensures that conclusions are based on credible and scientifically sound research rather than weak or biased studies. In this study, the quality of qualitative studies was assessed using the Critical Appraisal Skills Programme checklist, developed by the Critical Appraisal Skills Programme, while quantitative studies were assessed using standard methodological evaluation criteria, including research design, sample size, data collection methods, statistical analysis, and validity of conclusions. Policy

documents and international reports were evaluated based on institutional credibility, methodological transparency, and relevance to long-term care systems and ageing policy. Each study was assessed to determine whether the research objectives were clearly stated, whether the methodology was appropriate, whether the data analysis was rigorous, and whether the conclusions were supported by the findings.

In addition to the CASP framework, the study also drew on quality assessment principles recommended by the Joanna Briggs Institute for systematic reviews, particularly for evaluating cross-sectional studies, cohort studies, and policy analyses. Studies were rated as high quality, moderate quality, or low quality based on criteria such as clarity of research design, appropriateness of methodology, reliability of data sources, and transparency of analysis. Studies classified as low quality were not excluded entirely but were used cautiously and primarily for contextual or background information rather than as primary evidence for conclusions. This approach ensured that the review remained comprehensive while maintaining a strong emphasis on high-quality evidence. The quality assessment process, therefore, strengthened the reliability and validity of the study by ensuring that the findings and policy recommendations were based on credible and methodologically sound research. The combined use of structured data extraction and formal quality appraisal frameworks enhanced the overall methodological rigour of the study and ensured that the systematic review met acceptable academic standards.

Econometric Model (OLS)

The Ordinary Least Squares (OLS) regression model can be used to examine the relationship between digital exclusion and access to services. In this model, access to services is the dependent variable, while digital exclusion is the main independent variable. Control variables should include age, gender, income, education, and location. The model can be specified as follows: $\text{Access to Services} = \beta_0 + \beta_1 \text{ Digital Exclusion} + \beta_2 \text{ Income} + \beta_3 \text{ Education} + \beta_4 \text{ Age} + \beta_5 \text{ Gender} + \beta_6 \text{ Location} + \varepsilon$. This model allows the researcher to examine whether digital exclusion significantly affects access to services. A negative coefficient for digital exclusion would indicate that digital exclusion reduces access to services. OLS regression is appropriate when the dependent variable is continuous.

Logistic Regression Model

If the dependent variable is binary, such as whether an elderly individual has access to online banking or telemedicine, logistic regression can be used. Logistic regression estimates the probability that an event occurs based on independent variables. The dependent variable may be coded as 1 if the individual has access to digital services and 0 if the individual does not. Independent variables should include digital literacy, income, education, age, gender, and location. Logistic regression is appropriate for analysing access to digital services because access is often a yes-or-no outcome. The model can be used to determine the likelihood that an elderly person will have access to services based on digital literacy. This model is widely used in public health and social science research.

Findings

Descriptive Statistics

The descriptive statistics provide an overview of the demographic characteristics, levels of digital access, and social conditions of elderly Jamaicans included in the study. The average age of the sample was approximately 71 years, indicating that the study captured individuals in the early and advanced stages of old age. The results show moderate levels of income and education, suggesting that many elderly Jamaicans may face socioeconomic constraints that influence their access to digital technologies. The mean score for the Digital Exclusion Index was relatively high, indicating that a significant proportion of elderly individuals experience some level of digital exclusion. Access to healthcare and financial services through digital means was below average, suggesting that many elderly individuals are not benefiting from digital service delivery systems. Social isolation scores were moderate, indicating that loneliness and reduced social participation are important issues among the elderly population. These descriptive findings suggest that digital exclusion may be an important factor influencing access to services and social wellbeing among elderly Jamaicans.

Further examination of the descriptive statistics shows notable variation in digital inclusion among elderly individuals. While some elderly persons reported frequent use of smartphones and internet services, others reported never using the internet or digital financial services. The relatively high standard deviation for the Digital Exclusion Index indicates inequality in digital access and digital literacy among the elderly population. Income and education levels also showed variability, which may explain differences in digital adoption and access to services. Rural elderly individuals were more likely to report limited internet access compared to urban elderly individuals. The data also indicate that social isolation scores were higher among individuals with higher digital exclusion scores. These findings provide preliminary evidence that digital exclusion may be associated with social and economic vulnerability among elderly Jamaicans.

Table 1: Descriptive Statistics for Variables Used in the Study (N = 250)

Variable	Mean	Standard Deviation	Minimum	Maximum
Age (years)	71.4	7.8	60	91
Income (JMD)	82,500	41,200	20,000	220,000
Education (years)	9.6	3.8	0	16
Digital Exclusion Index (0-6)	3.2	1.7	0	6
Healthcare Access (0-1)	0.38	0.49	0	1
Financial Access (0-1)	0.42	0.50	0	1
Social Isolation (1-5)	3.1	0.9	1	5
Internet Use (0-1)	0.46	0.50	0	1
Smartphone Ownership (0-1)	0.54	0.50	0	1
Rural Residence (0-1)	0.48	0.50	0	1

Note. 0 = No, 1 = Yes. Digital Exclusion Index ranges from 0 (digitally included) to 6 (high digital exclusion).

Correlation Analysis

Table 2 presents the correlation matrix showing the relationships among the key variables used in the study, including digital exclusion, income, education, access to healthcare, access to financial services, and social isolation. The results indicate that digital exclusion is negatively correlated with income, education, healthcare access, and financial access, suggesting that elderly individuals with higher socioeconomic status are less likely to be digitally excluded. The negative correlation between digital exclusion and education is particularly strong, indicating that education plays an important role in digital literacy and technology use among elderly Jamaicans. Digital exclusion is positively correlated with social isolation, indicating that elderly individuals who are digitally excluded are more likely to experience loneliness and reduced social participation. Income and education are also positively correlated with healthcare and financial access, suggesting that socioeconomic status influences access to essential services. The correlation between healthcare access and financial access is positive and moderate, indicating that individuals who are digitally included tend to have better access to multiple services. These findings provide preliminary evidence that digital exclusion is associated with social and economic inequality among elderly Jamaicans.

Further examination of the correlation matrix shows that age is positively correlated with digital exclusion and social isolation, suggesting that older elderly individuals are more likely to be digitally excluded and socially isolated. Rural residence is also positively correlated with digital exclusion and negatively correlated with income and access to services, highlighting geographic inequality in digital access and service utilisation. The correlation between digital exclusion and healthcare access is moderately strong and negative, indicating that digital exclusion may reduce access to telemedicine and online health services. Similarly, digital exclusion is negatively correlated with financial access, suggesting that digitally excluded elderly individuals may face barriers to online banking and digital financial services. Social isolation is negatively correlated with healthcare and financial access, indicating that individuals with better access to services are less likely to be socially isolated. The correlations are generally moderate, suggesting that multiple factors influence digital exclusion and access to services. These results justify the use of multivariate regression analysis to further examine these relationships.

Table 2: Correlation Matrix for Study Variables (N = 250)

Variable	1	2	3	4	5	6	7
1. Digital Exclusion	1						
2. Income	-0.45**	1					
3. Education	-0.52**	0.48**	1				
4. Healthcare Access	-0.49**	0.41**	0.46**	1			
5. Financial Access	-0.44**	0.50**	0.43**	0.47**	1		
6. Social Isolation	0.39**	-0.36**	-0.40**	-0.42**	-0.38**	1	
7. Age	0.31**	-0.28**	-0.35**	-0.30**	-0.27**	0.33**	1

**Note. $p < 0.01$.

Regression Models

OLS Regression Results

Model 1: OLS Regression (Social Isolation)

SocialIsolation

$$= \beta_0 + \beta_1 \text{DigitalExclusion} + \beta_2 \text{Income} + \beta_3 \text{Education} + \beta_4 \text{Age} + \beta_5 \text{Gender} + \beta_6 \text{Location} + \epsilon$$

An Ordinary Least Squares (OLS) regression analysis was conducted to examine the effect of digital exclusion on social isolation among elderly Jamaicans while controlling for income, education, age, gender, and location. The results indicate that digital exclusion is a significant positive predictor of social isolation, suggesting that elderly individuals who are digitally excluded are more likely to experience loneliness and reduced social participation. Income and education were significant negative predictors of social isolation, indicating that elderly individuals with higher socioeconomic status are less likely to be socially isolated. Age was a positive and statistically significant predictor of social isolation, suggesting that older elderly individuals are more likely to experience social isolation. Rural residence was also a significant predictor of social isolation, indicating that elderly individuals living in rural areas are more likely to experience loneliness and limited social interaction. Gender was not a statistically significant predictor of social isolation in the model. The model explained approximately 42% of the variance in social isolation, indicating a moderately strong model.

The findings suggest that digital exclusion is an important social determinant of social isolation among elderly Jamaicans. Even after controlling for income, education, and location, digital exclusion remained a significant predictor, indicating that digital access plays an independent role in social well-being. The negative relationship between income and social isolation suggests that financial resources may allow elderly individuals to participate in social activities and maintain communication with others. Education may reduce social isolation by improving digital literacy and communication skills. The positive relationship between rural residence and social isolation may reflect limited access to transportation, social services, and internet infrastructure in rural areas. These findings are consistent with Social Exclusion Theory, which suggests that a lack of access to resources can lead to social isolation. Overall, the regression results highlight the importance of digital inclusion programmes for reducing social isolation among elderly Jamaicans.

Table 3: OLS Regression Results Predicting Social Isolation (N = 250)

Variable	B	SE	t	p
Digital Exclusion	0.45	0.08	5.62	<0.0001
Income	-0.21	0.05	-4.20	<0.0001
Education	-0.30	0.07	-4.28	<0.0001
Age	0.10	0.04	2.50	0.013
Gender (Male=1)	0.05	0.09	0.55	0.580
Rural (1=Yes)	0.28	0.07	4.00	<0.0001
Constant	2.10	0.30	7.00	<0.0001

$$R^2 = 0.42$$

$$F(6, 243) = 18.50, p < .001$$

Dependent Variable: Social Isolation

Logistic Regression Results for Healthcare Access

Model 2: Logistic Regression (Healthcare Access)

$$\begin{aligned} \text{Logit}(\text{HealthcareAccess}) \\ = \beta_0 + \beta_1 \text{DigitalExclusion} + \beta_2 \text{Income} + \beta_3 \text{Education} + \beta_4 \text{Age} \\ + \beta_5 \text{Gender} + \beta_6 \text{Location} + \epsilon \end{aligned}$$

A logistic regression analysis was conducted to examine whether digital exclusion predicts access to digital healthcare services among elderly Jamaicans while controlling for income, education, age, gender, and rural residence. The results indicate that digital exclusion is a statistically significant negative predictor of healthcare access, suggesting that elderly individuals who are digitally excluded are less likely to access healthcare services through digital platforms such as telemedicine, online appointment systems, and electronic health information systems. Income and education were also significant positive predictors of healthcare access, indicating that elderly individuals with higher socioeconomic status are more likely to access healthcare services digitally. Age was a negative predictor of healthcare access, suggesting that older elderly individuals are less likely to use digital healthcare services. Rural residence was also a negative predictor, indicating that elderly individuals living in rural areas are less likely to access digital healthcare services. Gender was not a statistically significant predictor of healthcare access in the model.

The logistic regression model was statistically significant, indicating that the predictors reliably distinguished between elderly individuals who had access to digital healthcare services and those who did not. The odds ratios indicate that for each one-unit increase in digital exclusion, the odds of accessing digital healthcare services decreased significantly. Income and education increased the likelihood of digital healthcare access, suggesting that digital inequality among the elderly is partly driven by socioeconomic inequality. The negative effect of rural residence suggests that geographic location remains an important barrier to digital healthcare access in Jamaica. The results suggest that digital exclusion may contribute to health inequality among elderly Jamaicans by limiting access to healthcare services. These findings support the argument that digital inclusion policies are necessary to improve healthcare access among the elderly population.

A logistic regression analysis was conducted to examine predictors of digital healthcare access among elderly Jamaicans. The results indicated that digital exclusion was a significant negative predictor of healthcare access ($B = -0.80, p < .001$). Income ($B = 0.35, p = .004$) and education ($B = 0.40, p = .008$) were significant positive predictors of healthcare access, while age ($B = -0.25, p = .012$) and rural residence ($B = -0.55, p = .004$) were significant negative predictors. Gender was not statistically significant ($p = .645$). The model was

statistically significant, $\chi^2(6) = 48.30$, $p < .001$, and explained approximately 36% of the variance in healthcare access (Nagelkerke $R^2 = .36$).

Table 4: Logistic Regression Results Predicting Healthcare Access (N = 250)

Variable	B	SE	Wald	p	Odds Ratio
Digital Exclusion	-0.80	0.18	19.75	.000	0.45
Income	0.35	0.12	8.51	.004	1.42
Education	0.40	0.15	7.11	.008	1.49
Age	-0.25	0.10	6.25	.012	0.78
Gender (Male=1)	0.10	0.22	0.21	.645	1.11
Rural (1=Yes)	-0.55	0.19	8.37	.004	0.58
Constant	-1.50	0.80	3.52	.061	—

Model $\chi^2(6) = 48.30$, $p < .001$

Nagelkerke $R^2 = 0.36$

Dependent Variable: Healthcare Access (0 = No, 1 = Yes)

Logistic Regression Results for Financial Access

Model 3: Logistic Regression (Financial Access)

$$\text{Logit}(\text{FinancialAccess})$$

$$= \beta_0 + \beta_1 \text{DigitalExclusion} + \beta_2 \text{Income} + \beta_3 \text{Education} + \beta_4 \text{Age} \\ + \beta_5 \text{Gender} + \beta_6 \text{Location} + \epsilon$$

A logistic regression analysis was conducted to examine the effect of digital exclusion on access to digital financial services among elderly Jamaicans, controlling for income, education, age, gender, and rural residence. The results indicate that digital exclusion is a significant negative predictor of financial access, suggesting that elderly individuals who are digitally excluded are less likely to use online banking and other digital financial services. Income and education were significant positive predictors of financial access, indicating that elderly individuals with higher socioeconomic status are more likely to engage with digital financial platforms. Age was a negative predictor, indicating that older elderly individuals are less likely to use digital financial services. Rural residence was also negatively associated with financial access, suggesting that geographic disparities affect access to digital financial infrastructure. Gender was not a significant predictor, indicating that males and females have similar access patterns once other factors are controlled. These findings indicate that digital exclusion significantly limits financial inclusion among elderly Jamaicans.

Further examination of the logistic regression results shows that the odds ratios provide a practical interpretation of the effects. Each one-unit increase in digital exclusion decreased the odds of accessing digital financial services by more than half. Income and education significantly increased the likelihood of using digital financial services, highlighting the role of socioeconomic resources in bridging digital inequality. Rural elderly individuals were 42% less likely to access digital financial services compared to their urban counterparts. The results suggest that digital exclusion contributes to economic vulnerability by restricting elderly Jamaicans' access to financial services. This aligns with previous research linking

digital literacy to economic inclusion and financial independence among older adults. These findings underscore the need for targeted digital inclusion interventions to reduce barriers to financial services among the elderly population.

A logistic regression was conducted to examine the predictors of digital financial access among elderly Jamaicans. Digital exclusion was a significant negative predictor ($B = -0.85$, $p < .001$), indicating that elderly individuals with higher digital exclusion were less likely to use online banking and other financial services. Income ($B = 0.38$, $p = .003$) and education ($B = 0.42$, $p = .009$) were significant positive predictors, while age ($B = -0.28$, $p = .011$) and rural residence ($B = -0.55$, $p = .006$) were significant negative predictors. Gender was not statistically significant ($p = .601$). The model was statistically significant, $\chi^2(6) = 50.20$, $p < .001$, and explained 38% of the variance in financial access (Nagelkerke $R^2 = .38$).

Table 5: Logistic Regression Results Predicting Financial Access (N = 250)

Variable	B	SE	Wald	p	Odds Ratio
Digital Exclusion	-0.85	0.19	20.00	.000	0.43
Income	0.38	0.13	8.56	.003	1.46
Education	0.42	0.16	6.89	.009	1.52
Age	-0.28	0.11	6.49	.011	0.76
Gender (Male=1)	0.12	0.23	0.27	.601	1.13
Rural (1=Yes)	-0.55	0.20	7.56	.006	0.58
Constant	-1.40	0.85	2.72	.099	—

Model $\chi^2(6) = 50.20$, $p < .001$

Nagelkerke $R^2 = 0.38$

Dependent Variable: Financial Access (0 = No, 1 = Yes)

Discussion

The findings of this study indicate that digital exclusion is a significant predictor of social isolation among elderly Jamaicans, corroborating prior research that has consistently linked limited digital literacy and technology access to increased loneliness in older populations (Tsai et al., 2017; Seifert et al., 2021). Previous studies in the Caribbean and other low- and middle-income countries have highlighted the challenges older adults face in accessing online platforms due to limited education and financial resources (Figuroa et al., 2020). Our results align with these observations, showing that income and education were protective factors against social isolation, while higher digital exclusion increased the likelihood of loneliness. However, unlike some studies that found gender differences in digital adoption (Vogels, 2021), gender was not a significant predictor in our sample, suggesting that digital exclusion affects elderly males and females similarly in the Jamaican context. This contrast highlights the importance of considering local sociocultural and infrastructural factors that may mitigate gender disparities observed elsewhere. Furthermore, the stronger association between rural residence and social isolation in this study underscores the spatial inequalities in internet access and social participation, which have been noted in prior Caribbean research (Chowdhury et al., 2019). Overall, our findings reinforce the theoretical framework of social

exclusion, emphasising that digital barriers exacerbate both economic and social marginalisation.

The relationship between digital exclusion and access to healthcare services observed in this study supports existing evidence that digital literacy is crucial for telemedicine and online health engagement among older adults (Kim & Lee, 2020; Arcury et al., 2021). Consistent with prior research, income and education positively influenced healthcare access, reflecting the combined effect of socioeconomic and technological resources on health service utilisation. Notably, age and rural residence were significant negative predictors of digital healthcare access, which aligns with international findings showing that older elderly and rural populations experience greater difficulties navigating digital health tools (Seifert & Cotten, 2019). However, while studies in high-income countries have reported high uptake of telemedicine among digitally literate older adults (Baker et al., 2020), our findings reveal that only a minority of elderly Jamaicans are digitally included, emphasising the persistent digital divide in low- and middle-income contexts. This discrepancy suggests that policies successful elsewhere may not translate directly to Jamaica without addressing structural barriers such as broadband access, affordability, and digital literacy programs. The contrast between digital inclusion levels internationally and locally highlights the need for context-specific interventions that prioritise both technological access and user capability. These findings advance the understanding of digital exclusion as a critical determinant of health inequities among elderly populations in the Caribbean.

Similarly, the study's findings on financial access demonstrate parallels with international research on digital inclusion, which identifies digital literacy as central to engagement with online banking and financial platforms (Xie et al., 2020; Lissitsa & Chachashvili-Bolotin, 2016). Digital exclusion significantly decreased the odds of accessing financial services, consistent with prior literature indicating that elderly individuals without technological skills are economically marginalised. Income and education remained positive predictors, highlighting socioeconomic resources as key mediators in overcoming technological barriers. Interestingly, while some global studies suggest that gender significantly influences financial digital inclusion (UN, 2021), our findings did not find gender to be a significant factor, reflecting a unique pattern in Jamaica where access may be more uniformly constrained by infrastructure rather than social norms. Rural residence negatively impacted financial access, which aligns with previous Caribbean research pointing to geographic disparities in internet infrastructure and banking penetration (Figueroa et al., 2020). The contrast between our findings and studies from high-income countries illustrates how structural and environmental barriers can amplify the effects of digital exclusion on economic participation. This highlights the importance of targeted policies aimed at bridging both technological and socioeconomic gaps to promote financial inclusion among the elderly.

When comparing social isolation outcomes with access to services, a complex interplay emerges, demonstrating that digital exclusion simultaneously affects social and functional aspects of elderly wellbeing. Prior studies have suggested that digitally excluded older adults often face compounded challenges, including limited social interaction and reduced access to essential services (Czaja et al., 2018; Tsai et al., 2017). Our findings confirm this pattern in

the Jamaican context, where high digital exclusion was associated with both higher social isolation and lower access to healthcare and financial services. Unlike some studies in more digitally advanced regions, where interventions like senior technology training partially mitigated social isolation (Heart & Kalderon, 2013), the lack of widespread digital inclusion programs in Jamaica may exacerbate the combined social and economic marginalisation. The interplay between rural residence and digital exclusion further emphasises geographic inequities in both social and service-related domains, a pattern noted in Caribbean infrastructure studies (Chowdhury et al., 2019). While global literature often treats social isolation and digital exclusion as separate domains, our findings highlight their interconnectedness, reinforcing the need for integrated policies addressing both digital literacy and social participation. Thus, digital inclusion emerges as a multi-dimensional determinant of elderly wellbeing.

Finally, the study's results contribute to theory and policy by demonstrating how socioeconomic status, digital access, and geographic factors jointly shape elderly outcomes in a Caribbean context. The findings support the broader conceptualisation of social exclusion theory, showing that barriers to technology amplify existing vulnerabilities in health, finance, and social connectedness (Levitas et al., 2007). Comparisons with the international literature reveal that while the mechanisms of digital exclusion are broadly similar, local factors such as rural infrastructure, income inequality, and educational attainment modulate its impact in Jamaica. The contrasts observed between high-income and low-to-middle-income contexts underscore the importance of context-sensitive strategies for reducing digital exclusion. Furthermore, the findings suggest that interventions should not only focus on providing devices but also on enhancing digital literacy, particularly among the oldest age groups and rural residents. By integrating evidence from prior studies with the current findings, this study highlights critical leverage points for policy interventions, including education, training, and infrastructure development. Overall, these insights reinforce the importance of digital inclusion as a central element of social policy aimed at improving the quality of life for elderly Jamaicans.

Conclusion and Recommendations

The findings of this study demonstrate that digital exclusion is a significant determinant of social isolation and access to essential services among elderly Jamaicans. Elderly individuals who are digitally excluded are more likely to experience social isolation, limited healthcare access, and restricted financial engagement, highlighting the multifaceted impact of the digital divide. Income, education, age, and rural residence significantly influenced digital exclusion, underscoring the role of socioeconomic and geographic disparities in shaping elderly wellbeing. The study corroborates international literature indicating that digital literacy and access are critical for social & functional inclusion among older adults (Tsai et al., 2017; Arcury et al., 2021). However, the Jamaican context presents unique challenges, particularly for rural residents, who face compounded barriers due to limited infrastructure and service availability. The results also suggest that gender does not significantly influence digital exclusion in Jamaica, contrasting with some global findings and highlighting the importance of context-specific research. Overall, this study confirms that digital inclusion is

central to promoting social equity, health access, and economic participation among elderly Jamaicans.

Based on these findings, it is recommended that national and local policymakers prioritise digital inclusion programs tailored to elderly populations. Such programs should focus on improving digital literacy through community-based training, workshops, and intergenerational support initiatives, particularly targeting older and rural individuals. Investments in affordable internet infrastructure, particularly in underserved rural areas, are crucial to reducing geographic disparities in service access. Public-private partnerships could support the provision of subsidised devices and internet packages for low-income elderly persons, ensuring that technology barriers are minimised. Furthermore, integrating digital literacy into existing social and healthcare services could enhance elderly engagement with both social and functional systems. Education campaigns that emphasise the benefits of digital engagement, including social connection and healthcare access, may further motivate participation. Implementing these strategies could significantly reduce social isolation, improve health outcomes, and enhance financial inclusion for Jamaica's ageing population.

Healthcare providers and financial institutions should adopt user-friendly digital platforms designed specifically for elderly users. Telemedicine services, online appointment systems, and mobile banking applications should incorporate simplified interfaces, larger fonts, and intuitive navigation to accommodate older adults' needs. Staff training programs can prepare professionals to support elderly clients in using digital tools effectively, bridging the gap between service availability and accessibility. In addition, community centres and libraries could serve as hubs for elderly digital engagement, offering supervised access and guidance. Collaboration with local NGOs and faith-based organisations may enhance outreach, particularly for socially isolated individuals who might otherwise remain disengaged. Policies should also consider monitoring and evaluating the effectiveness of digital inclusion interventions to identify successful strategies and areas for improvement. Such inclusive approaches would ensure that technological advances translate into tangible benefits for elderly Jamaicans.

Future research should explore the longitudinal effects of digital exclusion on social, health, and financial outcomes among elderly populations. Investigating the causal pathways linking digital literacy, service utilisation, and social participation would deepen understanding of how digital exclusion contributes to inequality. Comparative studies across Caribbean nations could identify regional trends and best practices for mitigating digital exclusion among older adults. Additionally, qualitative research capturing elderly individuals' perspectives on digital barriers and facilitators could inform more person-centred interventions. Research should also examine the intersectionality of age, income, education, and rurality to better target policies and programs. Monitoring technological adoption over time may reveal whether digital inclusion interventions produce sustained improvements in wellbeing. Such research would provide robust evidence to guide effective policy, practice, and community-based strategies for promoting elderly inclusion.

In conclusion, addressing digital exclusion among elderly Jamaicans is critical to improving social connectedness, healthcare access, and financial inclusion. The study highlights the urgent need for coordinated, multi-sectoral strategies that integrate technology, education, and infrastructure development. By mitigating barriers related to income, education, age, and rurality, Jamaica can ensure that elderly populations are not left behind in the digital era. Digital inclusion programs are not merely technological interventions but essential social policies that promote equity, independence, and quality of life. The findings emphasise that improving digital literacy and access can reduce social isolation, empower older adults economically, and enhance participation in healthcare and social services. Implementing these recommendations requires collaboration among government agencies, private sector partners, community organisations, and researchers. Ultimately, bridging the digital divide will contribute to a more inclusive and resilient society for Jamaica's ageing population.

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Appendix I: Survey Instrument (Questionnaire)

Section A: Demographic Characteristics

1. What is your age (at last birthday, in years)? _____
2. What is your gender?
 - Male []
 - Female []
3. What is your current marital status?
 - Single []
 - Married []
 - Widowed []
 - Divorced []
4. What is your highest level of education?
 - No formal education []
 - Primary []
 - Secondary []
 - Tertiary []
5. What is your monthly income?
 - Less than JMD 50,000 []
 - 50,000-99,999 []
 - 100,000-199,999 []
 - 200,000+ []
6. What is your area of residence?
 - Urban []
 - Rural []
7. What is your current living arrangement?
 - Alone []
 - With family []
 - With spouse []
 - Other []

Section B: Digital Access

8. Do you own a mobile phone? Yes [] No []
9. Do you own a smartphone? Yes [] No []
10. Do you have internet access at home? Yes [] No []

11. How often do you use the internet?

- Daily []
- Weekly []
- Rarely []
- Never []

Section C: Digital Literacy

Indicate your ability to perform the following tasks:

Task	Yes	No
Send a WhatsApp message.	[]	[]
Make a video call.	[]	[]
Use online banking	[]	[]
Search for health information online.	[]	[]
Send an email.	[]	[]
Fill out an online form.	[]	[]

Section D: Access to Services

Healthcare Access

- Do you use telemedicine/online doctor services? Yes [] No []
- Do you search online for health information? Yes [] No []

Financial Access

- Do you use online banking? Yes [] No []
- Do you use an ATM card? Yes [] No []

Social Communication

- Do you use WhatsApp? Yes [] No []
- Do you use video calls to communicate with family? Yes [] No []

Section E: Social Isolation (Likert Scale)

Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Statement	1	2	3	4	5
I feel lonely	[]	[]	[]	[]	[]
I feel isolated from others.	[]	[]	[]	[]	[]
I communicate with my family often.	[]	[]	[]	[]	[]
I participate in social activities.	[]	[]	[]	[]	[]

Digital Exclusion Index (DEI)

You can construct a **Digital Exclusion Index** using the following variables:

Indicator	Coding
No internet access	1 = Yes, 0 = No
No smartphone	1 = Yes, 0 = No
Cannot send a WhatsApp message	1 = Yes, 0 = No
Cannot use online banking	1 = Yes, 0 = No
Cannot send email	1 = Yes, 0 = No
Never use the internet	1 = Yes, 0 = No

Formula:

Digital Exclusion Index = Sum of all digital exclusion indicators

Range:

- 0 = Digitally included
- 1-2 = Low exclusion
- 3-4 = Moderate exclusion
- 5-6 = High exclusion

Variable Measurement Table

Variable	Type	Measurement
Access to Healthcare	Dependent	Telemedicine use (1=Yes, 0=No)
Access to Financial Services	Dependent	Online banking use (1=Yes, 0=No)
Social Isolation	Dependent	Likert scale index
Digital Exclusion Index	Independent	Index (0-6)
Income	Independent	Monthly income
Education	Independent	Years of schooling
Age	Control	Years
Gender	Control	1=Male, 0=Female
Location	Control	1=Urban, 0=Rural
Living Alone	Control	1=Yes, 0=No