Prevalence and Incidence of Frontotemporal Dementia in Low- and Middle-Income Countries: A Systematic Review Protocol

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Abstract

Background: In many low- and middle-income countries (LMICs), the incidence of frontotemporal dementia (FTD) appears to be rising, yet insufficient epidemiological data and subsequent under-reporting obscure its true impact. This gap in knowledge undermines efforts to secure the resources needed for comprehensive FTD care and also complicates the development of targeted public health strategies in these regions. **Objective:** To examine the incidence and prevalence of FTD in low- and middle-income countries and explore how methodological and contextual factors (e.g., diagnostic criteria, health system infrastructure, and under-reporting) influence the accuracy of these estimates and the development of effective public health responses. **Methods**: We developed this protocol using the PRISMA-P (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols) guidelines. Our plan is to perform a thorough search of the following electronic databases: MEDLINE, Embase, CINAHL, Google Scholar, PsycInfo, and Global Index Medicus (WHO), covering all records from their inception through January 31, 2025. Additional studies will be identified through reference lists of relevant full-text articles. Two independent reviewers will complete initial screening, data extraction, and bias assessment using the Joanna Briggs Institute critical appraisal tools for cohort and analytical cross-sectional research. Studies that are homogeneous will be subjected to meta-analysis; any that are not will be discussed through a narrative summary. **Expected Results:** Help illuminate the true impact of FTD in LMICs, provide guidance for more effective policies, and lay a solid foundation for future research that improves diagnosis, treatment, and outcomes. **Relevance**: This review will advance our knowledge, improve health care outcomes, and promote equity in addressing FTD in LMICs.

Background

Frontotemporal dementia (FTD) is a neurodegenerative disorder marked by the progressive deterioration of the frontal and temporal lobes of the brain, leading to notable changes in personality, language, and behavioural patterns (Bang et al., 2015). Although it is the second most common form of early-onset dementia, FTD remains under-recognized, particularly in low- and middle-income countries (LMICs), but it is gradually gaining attention (George-Carey et al., 2012; Hogan et al., 2016). These regions face unique health care challenges, including limited access to diagnostic tools, underdeveloped health care infrastructure, and a lack of trained specialists (Duthey, 2013). Consequently, the true burden of FTD in these populations is likely under-reported, leading to gaps in understanding both its prevalence and incidence.

While research on FTD has gained momentum in high-income countries, there exists a notable gap in our understanding of its prevalence and incidence in LMICs. The underestimation of FTD in LMICs represents a significant public health concern. The absence of accurate data exacerbates existing limitations of health care resources and delays the implementation of effective diagnostic and therapeutic strategies. Furthermore, the growing elderly population in these regions amplifies the need for a critical examination of neurodegenerative diseases. With a shifting demographic landscape, it is imperative to take stock of how literatures have described the burden of FTD, as early detection and intervention could mitigate its profound personal and societal impacts. LMICs are characterized by rich cultural and genetic diversity (Campbell & Tishkoff, 2008; Fatumo et al., 2022). The presentation and progression of frontotemporal dementia (FTD) are not uniform across populations, highlighting the need for a more contextually-informed approach to understanding its prevalence and incidence in diverse cultural settings (Akinyemi et al., 2022; George-Carey et al., 2012). In many LMICs, neurological disorders are frequently underdiagnosed, a reality made worse by deeply ingrained cultural stigmas and systemic barriers to health care access (George-Carey et al., 2012). The absence of reliable epidemiological data not only distorts our perception of FTD's true burden but also limits the development of effective public health responses. A critical examination of FTD prevalence and incidence in these contexts is therefore essential—not only to address under-reporting but to advocate for more robust diagnostic frameworks and equitable health care interventions.

With the population aging in LMICs and a consequent increase in incidence of dementia, there is currently a drive for more studies on dementia in these regions (Akinyemi et al., 2019; Akinyemi et al., 2022). Despite FTD being nearly as prevalent as Alzheimer's disease, research—particularly clinical trials—continues to overwhelmingly focus on the latter. This imbalance reflects a broader issue: the systemic neglect of less conventional dementias, particularly in LMICs, where health care resources are already stretched thin. Given that resource allocation in LMICs must be evidence-based, the lack of robust epidemiological data on FTD results in its persistent under-recognition and underfunding. This systematic review examines the prevalence and incidence of FTD in these regions, exposing the methodological, diagnostic, and structural barriers that obscure FTD's true impact. Uniquely, this review challenges the current research and policy paradigms, advocating for a more equitable distribution of resources and a recalibration of dementia research priorities in LMICs. This review seeks to catalyze informed policy reforms and drive urgent investments in research, diagnosis, and care for people living with FTD, which has remained largely invisible in global health discourse.

Research Question

1. What is the reported incidence and prevalence of frontotemporal dementia in low- and middle-income countries, and how do methodological and contextual factors (e.g., diagnostic criteria, health system infrastructure, and under-reporting) influence the accuracy of these estimates and the development of effective public health responses?

Methods

Protocol and Registration

This protocol has been developed in accordance with the PRISMA-P (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols) guidelines (Moher et al., 2015) and follows the recommendations set out by the Meta-analysis of Observational Studies in Epidemiology guidelines. It has been registered with the International Prospective Register of Systematic Reviews (PROSPERO) under the reference CRD42023473937. Any amendments made to the protocol will be documented and reported alongside the final systematic review findings.

Systematic Review and Team Members

The lead investigators (OE, CO, and OO) will oversee the review process, including developing research questions, designing search strategies, screening articles, extracting and analyzing data, and preparing the manuscript. Content expertise will be provided by OO and CO. Two reviewers will independently screen article titles and abstracts, while OO and CO will conduct full-text screening and data extraction. A subject librarian specializing in systematic reviews will design and execute search strategies across relevant databases. OE, CO, and OO will synthesize the literature using systematic methods. Statistical analysis, including meta-analysis, will be conducted by CO and OO. This protocol follows the PRISMA-P guidelines, with a PRISMA-P checklist provided in an additional file. Any protocol modifications will be documented and published with the review results.

Eligibility Criteria

This study will review human studies that meet the following criteria (Table 1) using the PICO framework (Participants, Interventions, Comparators, and Outcomes). It will be restricted to studies conducted in the English language from database inception up to January 31, 2025.

Information Sources

The electronic searches will be conducted using MEDLINE, Embase, CINAHL, Google Scholar, PsycInfo, and Global Index Medicus (WHO). This search will be streamlined to focus on LMICs and studies conducted from inception to January 31st, 2025.

Search

The search terms were determined through consultations with the librarian, a geriatrician, a content expert, and review authors OO and CO. We have already conducted a string-search that was first developed for MEDLINE (Appendix A) and will be adapted for the other five databases. These search strings will combine terms related to frontotemporal dementia and its prevalence and incidence in LMICs. Boolean operators will be utilized. Keywords selected will include all possible combinations of terms reflecting the following:

Table 1

Eligibility Criteria for Systematic Review

Population	**Included**: ● Elderly person as defined by WHO: aged 60 and above ● Research articles in the English language ● Original research articles focusing on frontotemporal dementia (FTD) in low- and middle-income countries (LMICs) ● Only primary sources will be used, to avoid bias and inaccurate data ● Articles published from inception to January 31st, 2025 **Exclusion**: ● Studies not available in the English language ● Studies conducted on people below 60 years of age
Outcome	**Main Outcome:** Incidence and prevalence of FTD **Secondary Outcome:** ● Risk factors associated with FTD ● Incidence and prevalence of subtypes of FTD

Prevalence
(Prevalence* OR frequency* OR incidence*) AND

Frontotemporal dementia
('Frontotemporal dementia' OR 'frontotemporal degeneration' OR 'frontal lobe dementia' OR 'Picks disease' OR 'Primary progress aphasia') AND

LMIC's
(developing countr* OR developing nation? OR developing population? OR developing world OR less developed countr* OR less developed nation? OR less developed population? OR less developed world OR lesser developed countr* under developed nation? OR underserved world OR under served countr* OR under served population? OR under served world OR deprived countr* OR deprived nation? OR poor countr* OR poor nation? OR poor population? OR poor world OR poorer countr* OR poorer nation? OR poorer population? OR poorer world OR developing econom* OR less developed econom* OR lesser developed econom* OR under developed econom* OR underdeveloped econom* OR middle income econom* OR low income econom* OR lower income econom* OR low gdp OR low gnp OR low gross domestic OR low gross national OR lower gdp OR lower gnp OR emerging economies OR emerging nation?**)**

Sources of Evidence

Data Management
The outcomes of the conducted database search will be transferred to Zotero 6.0, a citation manager. Subsequently, duplicates will be systematically eliminated. Following the deduplication process, the identified articles will be exported to Rayyan, a web-based systematic review management tool. Covidence will be utilized for screening of titles, abstracts, and full texts. The results of this screening process, categorizing both included and excluded articles, will be exported and organized to facilitate the generation of the PRISMA flow chart.

Data Screening

The eligibility screening will take place in two stages: a review of titles and abstracts, followed by a full-text assessment. At each stage, two reviewers (OO and OC) will work independently to ensure a thorough evaluation. To refine the process, we will carry out a pilot screening where both reviewers will independently assess the first 50 articles, compare their findings, and resolve any discrepancies. The results of their screenings will be compared and reconciled to enhance inter-reviewer agreement before proceeding to the full-text screening phase. This step will help establish consistency between reviewers before proceeding with the full screening process.

Data Extraction Process

Data extraction will be independently carried out by OO and OC and supervised by OE using a standardized data extraction form set up on a Microsoft Excel spreadsheet (Appendix B). In cases of conflicts during either the screening or data extraction stages, the third review author, OE, will intervene to resolve discrepancies. Following the methodological guidelines of Lipsey and Wilson (2000) and Khaliq et al. (2022), relevant information will be extracted from each study.

Data Items and Outcomes

Data items and outcomes will include citation details such as the first author, year, and country of publication, as well as study design (cohort, case-control, cross-sectional, or longitudinal study), geographic location of study, status as LMIC (based on World Bank designation), the sample characteristics, method of assessment/diagnostic criteria for FTD and its subtypes, and percentage of FTD and risk factors studied/associated with FTD.

Risk of Bias Assessment

Risk of bias assessments at the study level will be completed independently by the two reviewers (OO and OC). The quality of the studies included in this review will be evaluated using the Joanna Briggs Institute (JBI) critical appraisal tools for cohort and analytical cross-sectional studies (Moola et al., 2015). These tools are widely used for assessing observational studies due to their clear instructions and structured approach (Khaliq et al., 2022). Two reviewers will independently assess each study, and if there are any disagreements, a third reviewer will step in to help resolve them.

Data Synthesis

Narrative Synthesis

A qualitative synthesis will be used to summarize the results of all included studies. Studies will be grouped based on risk factors, and sub-types of frontotemporal dementia will be compared between studies.

Meta-analysis

The meta-analysis will be conducted using the Comprehensive Meta-Analysis (CMA, Version 4) software (Borenstein, 2022). To measure the overall effect, Fisher's z-transformed correlation coefficient will be used, reported alongside its 95% confidence interval and *p* value. In cases where multiple effect sizes are reported from the same population, the average effect size will be included in the analysis (Nielsen et al., 2020). For studies with independent subgroups, each subgroup will be treated as a separate sample. CMA software applies inverse variance weighting to combine studies, ensuring a more precise overall estimate. A forest plot will be generated to visualize the results, while a funnel plot will be used to assess potential publication bias. The prevalence of frontotemporal dementia will be assessed, and a meta-analysis will be performed. We will calculate pooled prevalence and 95% confidence intervals using a random effects model for all included studies and

those at low risk of bias. We will assess heterogeneity with a *p* value < 0.05 considered as significant. We will also report findings following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2015).

Confidence in cumulative evidence

The summary of evidence will be assessed using GRADE (Schünemann, et al., 2013). The source of evidence and bias due to study limitations and reporting will be considered in the cumulative evidence.

Discussion and Potential Impacts

This review on the prevalence and incidence of frontotemporal dementia (FTD) in low- and middle-income countries (LMICs) is the first of its kind. This systematic review is expected to highlight variations in the prevalence and incidence of FTD across LMICs. Gaining a clearer understanding of the true burden of FTD could facilitate earlier diagnosis, improve differentiation from other dementias, and support more tailored management strategies, ultimately enhancing patient outcomes and quality of life (Akinyemi et al., 2022; Elugbadebo et al., 2021). An evidence-based approach to addressing FTD would allow for more effective resource allocation, including the training of health care professionals, the development of reliable diagnostic tools, and the establishment of specialized care programmes for those affected by the condition.

A systematic review will identify critical gaps in current diagnostic criteria, health care access, and reporting systems within LMICs. Addressing these gaps would ensure that FTD cases are recognized and recorded more effectively, contributing to improved data quality for future research and health care planning. Identifying the scarcity of reliable data on FTD in LMICs could also stimulate future research initiatives. This would encourage collaborative, multi-disciplinary research to better understand the disease and its impact, focusing on specific socio-cultural and economic challenges faced in LMICs (Adebusoye et al., 2020; Oyinlola, 2024). Informed policy and resource allocation are crucial outcomes that can guide policy-makers in LMICs. Furthermore, the review's findings will help address the global imbalance in dementia care and research. With its focus on low- and middle-income countries where resources are often constrained, this review highlights the need for international collaboration and funding, ensuring that care and research efforts are more equitably supported across varying socio-economic contexts.

Conflict of Interest

The authors declare no conflicts of interest.

Declaration of Ethics

Ethics application is not required for this study.

Author Contributions

OE: Conceptualization, data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources, software, supervision, validation, visualization, writing – original draft and review/editing.

CO: Conceptualization, data curation, formal analysis, investigation, methodology, resources, software, writing – original draft and review/editing.

OO: Data curation, formal analysis, investigation, methodology, resources, software, writing – original draft and review/editing.

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Appendices

Appendix A – MEDLINE Search String

	Ovid MEDLINE(R) ALL <1946 to September 09, 2024>	
1	(Prevalence* or frequency* or incidence*).mp. [mp=title, book title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms, population supplementary concept word, anatomy supplementary concept word]	908890
2	('Frontotemporal dementia' or 'frontotemporal degeneration' or 'frontal lobe dementia' or 'Picks disease' or 'Primary progress aphasia').mp. [mp=title, book title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms, population supplementary concept word, anatomy supplementary concept word]	11907
3	1 and 2	1112
4	(older adult* or old* or aging or age* or old age or elder* or geriatric* or gerontolog* or senior* or frail*).mp. [mp=title, book title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms, population supplementary concept word, anatomy supplementary concept word]	14398546
5	3 and 4	826
6	(developing countr* or developing nation? or developing population? Or developing world or less developed countr* or less developed nation? Or less developed population? or less developed world or lesser developed countr* under developed nation? or underserved world or under served countr* or under served population? or under served world or deprived countr* or deprived nation? or poor countr* or poor nation? or poor population? or poor world or poorer countr* or poorer nation? or poorer population? or poorer world or developing econom* or less developed econom* or lesser developed econom* or under developed econom* or underdeveloped econom* or middle income econom* or low income econom* or lower income econom* or low gdp or low gnp or low gross domestic or low gross national or lower gdp or lower gnp or emerging economies or emerging nation?).mp. [mp=title, book title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms, population supplementary concept word, anatomy supplementary concept word]	164905

Appendix B – Data Extraction Sheet

Date:	
Reviewers' details:	
Article title	
Year of publication	
First author's name	
Countries	
Research questions/objectives	
Theoretical framework	
Study design	
Methodology (qualitative or quantitative)	
Location of the study (community, hospital or nursing home, or home)	
Sample size	
Method of assessment/diagnostic criteria used	
Percentage of FTD reported	
Risk factors studied/associated with FTD	
Inferential statistics	
p value	
Other key findings noticed from the article	
Reflections of the reviewers	