

The Burden of Mental Disorders in Ethiopia, from 1990 to 2019: A Systematic Analysis of the Global Burden of Diseases Study 2019

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Abstract

Background: Currently, non-communicable diseases are prevailing in Ethiopia, with mental disorders being a significant contributor. However, there is a lack of substantial evidence regarding the impact and distribution of these illnesses across the country.

Objective: This study aims to evaluate the occurrence, prevalence, and disability-adjusted life years associated with mental disorders in all regional states and chartered cities of Ethiopia between 1990 and 2019.

Methods: In this study, the 2019 Global Burden of Diseases data, tools, processing, and estimation techniques were used to estimate incidence, prevalence, and disability-adjusted life years due to mental disorders in all regional states and chartered cities in Ethiopia from 1990-2019. The Bayesian meta-regression disease modeling (DisMR.2) and causes of death ensemble modeling (CODEm) methods were used to calculate fatal and non-fatal health metrics values over time. The spatiotemporal Gaussian process regression was employed to transfer strength between points and over time for each relevant metric. All available data sources including population census, household surveys, demographic surveillance, disease registry, health service use, disease notifications, and other data, were used for this analysis. Each metric was estimated per 100,000 populations with a 95% uncertainty interval.

Results: The most common forms of mental disorders in Ethiopia were depressive disorders [4,650 cases (4,166-5,200)], anxiety disorders [3,466 cases (2,967-4,084)], bipolar disorders [614 cases (520-720)], and schizophrenia [213 cases (182-247)]. Mental disorders accounted for about 4.0% (4.5% female vs. 3.5% male) of the total burden of diseases from all causes in Ethiopia, with 1,393 disability-adjusted life years (1,019-1,845). Addis Ababa city administration had the highest disability-adjusted life years due to mental disorders, whereas the Somali region had the lowest.

Conclusion: This study has indicated that depressive disorders, anxiety disorders, bipolar disorders, and schizophrenia were the most common mental disorders in Ethiopia from 1990 to 2019, indicating that there were unparalleled prevention and treatment efforts to halt the burdens due to these disorders. Moreover, there were variations in the distribution of the burden of mental disorders at the sub-national level. Therefore, mental health interventions should include addressing common disorders and inter-regional disparities. [*Ethiop. J. Health Dev.* 2023; 37 (SI-2)]

Keywords: anxiety disorders, bipolar disorders, depressive disorders, disability-adjusted life years, global burden of diseases, incidence, mental disorders, prevalence, schizophrenia

Background

Mental health is a fundamental and indispensable human right. It signifies the capacity for thought, emotion, and behavior that enables individuals to cope with stress, study, or work productively, contribute to their social well-being. However, those who suffer from mental disorders are subjected to severe human rights violations, including sexual harassment, stigma, and discrimination (1). According to the 2019 Global Burden of Diseases (GBD) study, mental disorders are among the leading causes of public health problems globally, and more than 125 million years of disability are attributed to mental disorders. Moreover, the age-standardized disability-adjusted life years (DALYs) attributed to mental disorders have increased from 3.1% to 4.9% from 1990 to 2019 (2). It is estimated that about 80% of people living in low- and middle-income countries experience an episode of a mental disorder in their lifetime. Due to the poor health system, mythical explanations, stigma, and inadequate funding, these disorders are not being treated at most primary care and community levels in these settings (3).

Preventing mental health problems is a public health concern given priority by the international community. The fourth target of the United Nations' Sustainable Development Goal three has promised to "reduce premature mortality from non-communicable diseases by one-third and promote mental health and well-being by 2030" (4). In line with this, the World Health Organization has introduced a new initiative to transform mental health (5). The government of Ethiopia has also shared these global initiatives and incorporated them into its national health sector strategic documents, including the health system transformation plan, mental health strategy, and health extension program, intending to build accessible, acceptable, and affordable mental health services for all citizens. At the village level, the health extension workers provide mental health education, identify new cases, refer them to health facilities for further investigation, and support treatment adherence. In addition to the efforts of health extension workers, other initiatives aim to improve mental health outcomes in Ethiopia. One such initiative is integrating mental health services into primary care facilities. This approach recognizes that mental health is an integral

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part of overall health and seeks to address it holistically. Another important aspect of this initiative is training primary care providers to identify and treat common mental disorders, such as depression and anxiety. This improves access to care for those in need and reduces the stigma associated with seeking help for mental health issues. Furthermore, community-based interventions, such as support groups and peer counseling, are effective in improving mental health outcomes (6-8). Overall, this initiative requires a systematic analysis of high-quality data to monitor progress and make informed decisions about resource allocation.

However, the country does not understand the national and sub-national burden of mental disorders. The previous pocket studies conducted in different settings revealed different estimates, highlighting that there would be substantial inter-regional variations in the burden of mental disorders over time (9-10). In addition, existing systematic reviews and meta-analyses do not show the sub-national burden of mental disorders (11). This lack of data is concerning, as it suggests that mental health needs may not be fully understood or addressed in different regions. It is difficult to allocate resources and develop effective interventions without a clear understanding of the prevalence and impact of mental disorders in specific areas. Therefore, this study analyzed the incidence, prevalence, and DALYs due to mental disorders in all regional states and chartered cities in Ethiopia from 1990 to 2019 by using data from the 2019 GBD study. The study findings will inform policies and programs targeted at improving the mental health of citizens in Ethiopia. Moreover, the study findings may contribute to the growing mental health research in low-income countries.

Methods

Setting

Ethiopia is Africa's second most populous country, with an estimated population of 112 million in 2019. The country is administratively divided into 10 regional states and two chartered city administrations in 2020. In this analysis, the South-West Ethiopian People's and Sidama regions were under the Southern Nations, Nationalities, and People's (SNNP) region. The population's median age is 20 years, with an annual population growth rate of 2.5% in 2020. About 80% of the population resides in rural areas (12).

Data sources and analyses

The analyses were produced by the Ethiopian Subnational Burden of Disease Initiative, a collaborative endeavor between the National Data Management and Analytics Center for Health (NDMC) under the Ethiopian Public Health Institute (<https://ndmc.eph.gov.et/>) and the Institute for Health Metrics and Evaluation (IHME, University of Washington), as part of the 2019 GBD study (13). The GBD study quantifies the global, regional, national, and sub-national burden of 369 diseases and injuries, 87 risk factors, and over 3,000 disease sequels (14). The causes of disease and injury are closely related to the International Classification of Diseases diagnostic categories. The study provides a powerful basis for detailed and broad insights into global health trends and emerging challenges. The Bayesian meta-regression disease modeling (DisMR.2) and causes of death ensemble modeling (CODEm) methods were used to calculate fetal and non-fetal health metrics values over time.

Moreover, the GBD estimates are updated for the entire time series based on including new data and modifications to the methods. The spatiotemporal Gaussian process regression transfers strength between points and over time for each relevant metric. Thus, the 2019 GBD results take precedence over those from earlier rounds. The details of the estimation techniques and data sources have been reported at: <http://ghdx.healthdata.org/gbd-2019/data-input-sources>. We have described the burden of mental disorders by incidence, prevalence, and DALYs (i.e., a composite measure of mortality and disability) for all regional states and chartered cities in Ethiopia from 1990 to 2019. Each metric was estimated per 100,000 populations with a 95% uncertainty interval.

Results

Incidence and prevalence

The most common incident cases of mental disorders from 1990 to 2019 were depressive disorders [5,838 cases (5,017-6,705) to 5,201 cases (4,478-5,987)] and anxiety disorders [571 cases (459-689) to 554 cases (447-667)], followed by conduct disorders and eating disorders. Moreover, the most prevalent cases in 2019 were depressive disorders [4,650 cases (4,166-5,200)], anxiety disorders [3,466 cases (2,967-4,084)], followed by bipolar disorders [614 cases (520-720)] and schizophrenia [213 cases (182-247)]. The distributions of each of these disorders were observed to be nearly similar across the regional states from 1990 to 2019 (Tables 1 and 2).

Table 1. The incidence of mental disorders per 100,000 population in regional states in Ethiopia, 1990-2019

Location	Year	Mental Disorders (95% UI)							
		Depressive Disorders	Anxiety Disorders	Schizophrenia	Bipolar Disorders	Conduct Disorder	Eating Disorders	ADH Disorder	Autism Spectrum
Ethiopia	1990	5,838 (5,017-6,705)	571 (459-689)	15 (13-17)	61 (51-72)	222 (164-288)	95 (65-132)	33 (22-50)	10 (8-12)
	2019	5,201 (4,478-5,987)	554 (447-667)	15 (12-17)	61 (51-72)	222 (163-287)	112 (77-156)	33 (22-50)	10 (8-12)
Addis Ababa	1990	5,723 (4,939-6,565)	575 (459-701)	14 (12-16)	61 (51-73)	219 (161-284)	130 (88-183)	33 (21-49)	11 (9-13)
	2019	5,169 (4,465-5,968)	563 (452-680)	14 (12-17)	61 (51-73)	218 (160-284)	146 (99-203)	33 (21-49)	10 (8-12)
Afar	1990	5,645 (4,883-6,522)	559 (443-680)	15 (13-18)	65 (54-76)	227 (168-293)	94 (64-131)	34 (22-51)	9 (8-11)
	2019	5,052 (4,383-6,422)	549 (436-668)	15 (13-17)	65 (54-76)	226 (166-292)	115 (78-161)	34 (22-51)	10 (8-12)
Amhara	1990	5,812 (4,981-6,763)	569 (458-694)	15 (13-17)	61 (51-72)	223 (164-288)	93 (63-130)	34 (22-50)	10 (8-12)
	2019	5,203 (4,508-6,026)	554 (446-669)	15 (12-17)	61 (51-72)	221 (163-287)	112 (76-157)	33 (22-50)	10 (8-12)
Ben. Gumuz	1990	5,717 (4,922-6,580)	572 (457-697)	15 (13-18)	64 (53-76)	222 (163-287)	91 (62-127)	33 (22-50)	10 (8-12)
	2019	5,121 (4,405-5,872)	553 (446-669)	15 (13-17)	64 (53-76)	222 (163-287)	110 (74-155)	33 (22-50)	10 (8-12)
Dire Dawa	1990	5,750 (4,987-6,653)	573 (456-698)	14 (12-17)	60 (51-71)	221 (163-287)	120 (82-170)	33 (22-50)	11 (9-13)
	2019	5,167 (4,463-5,946)	556 (442-672)	14 (12-17)	60 (51-71)	221 (163-287)	138 (94-191)	33 (22-50)	10 (8-12)
Gambella	1990	5,808 (4,998-6,683)	587 (467-724)	15 (12-17)	61 (52-73)	215 (157-281)	93 (63-130)	32 (21-48)	10 (8-12)
	2019	5,175 (4,457-5,947)	555 (448-668)	15 (12-17)	61 (52-73)	224 (165-289)	117 (70-161)	34 (22-50)	10 (8-12)
Harari	1990	5,789 (4,997-6,705)	575 (465-701)	14 (12-17)	61 (51-73)	222 (163-287)	117 (79-163)	34 (22-50)	11 (9-13)
	2019	5,172 (4,486-5,934)	554 (445-666)	14 (12-17)	61 (51-73)	222 (163-287)	136 (92-191)	33 (22-50)	10 (8-12)
Oromia	1990	5,887 (5,061-6,732)	571 (455-694)	15 (13-17)	61 (51-72)	222 (163-287)	93 (63-131)	33 (22-50)	10 (8-12)
	2019	5,250 (4,535-6,022)	553 (444-673)	15 (12-17)	61 (51-72)	222 (163-287)	111 (75-154)	33 (22-50)	10 (8-12)
Somali	1990	5,629 (4,849-6,455)	566 (454-688)	15 (13-17)	61 (51-72)	226 (167-292)	92 (62-129)	34 (22-51)	10 (8-12)
	2019	4,993 (4,297-5,733)	547 (443-661)	15 (13-17)	61 (51-72)	226 (166-292)	110 (75-153)	34 (22-51)	10 (8-12)
SNNPR	1990	5,820 (4,997-6,733)	573 (462-695)	15 (13-17)	61 (51-72)	222 (163-287)	91 (62-128)	33 (22-50)	10 (8-12)
	2019	5,205 (4,485-5,987)	555 (448-675)	15 (13-18)	61 (51-72)	221 (163-287)	108 (74-152)	33 (22-50)	10 (8-12)
Tigray	1990	5,770 (4,949-6,658)	576 (464-706)	15 (13-17)	61 (51-73)	222 (163-287)	96 (64-133)	33 (22-50)	10 (8-12)
	2019	5,168 (4,460-5,956)	556 (451-680)	15 (12-17)	61 (51-73)	221 (163-287)	114 (78-161)	33 (22-50)	10 (8-12)

Table 2. The prevalence of mental disorders per 100,000 population in regional states in Ethiopia, 2019

Location	Mental Disorders (95% UI)			
	Depressive Disorders	Anxiety Disorders	Schizophrenia	Bipolar Disorders
Ethiopia	4,650 (4,166-5,200)	3,466 (2,967-4,084)	213 (182-247)	614 (520-720)
Addis Ababa	4,731 (4,197-5,279)	3,530 (3,025-4,168)	218 (186-254)	613 (518-718)
Afar	4,526 (4,035-5,058)	3,387 (2,864-4,026)	210 (179-242)	600 (509-710)
Amhara	4,648 (4,154-5,225)	3,466 (2,951-4,085)	214 (182-248)	615 (518-724)
Ben. Gumuz	4,586 (4,107-5,125)	3,429 (2,918-4,036)	211 (179-242)	604 (508-709)
Dire Dawa	4,624 (4,143-5,197)	3,490 (2,935-4,133)	218 (185-252)	616 (517-720)
Gambella	4,624 (4,140-5,255)	3,466 (2,927-4,088)	217 (185-253)	614 (519-718)
Harari	4,641 (4,150-5,184)	3,498 (2,976-4,121)	213 (181-247)	614 (516-719)
Oromia	4,677 (4,192-5,247)	3,465 (2,939-4,086)	214 (183-248)	616 (522-717)
Somali	4,486 (3,999-5,034)	3,377 (2,898-3,966)	214 (183-247)	613 (521-716)
SNNPR	4,650 (4,167-5,172)	3,472 (2,939-4,105)	210 (177-244)	615 (518-720)
Tigray	4,631 (4,141-5,169)	3,489 (2,994-4,146)	213 (182-249)	613 (516-721)

Disability-adjusted life years (DALYs)

Mental disorders accounted for about 4.0% (4.5% female vs. 3.5% male) of the total DALYs from all causes in Ethiopia in 2019, with 1,393 DALYs (1,019-1,845). Addis Ababa city administration had the highest DALYs due to mental disorders, followed by the Tigray region and Dire Dawa city administration,

whereas the Somali region had the lowest DALYs (Figure 1). Depressive disorders, anxiety disorders, schizophrenia, bipolar disorders, and other mental disorders were the leading contributors to DALYs from 1990-2019 (Figure 2).

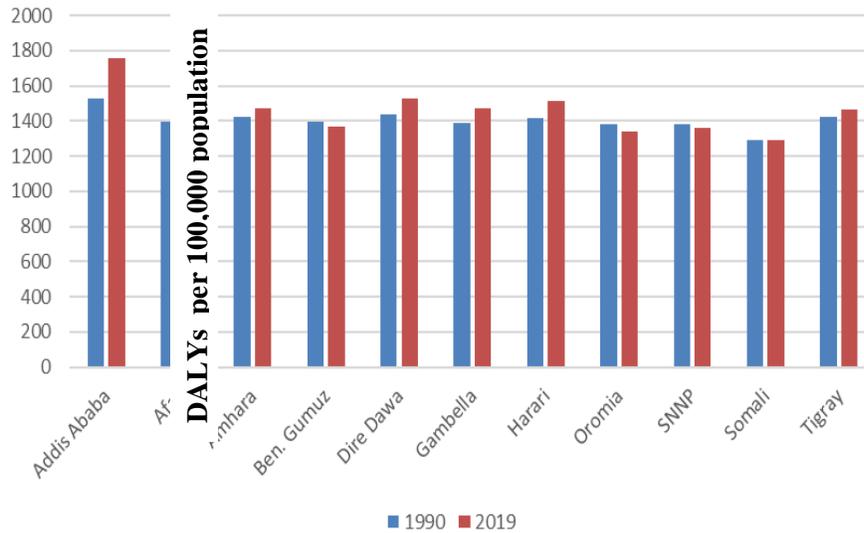
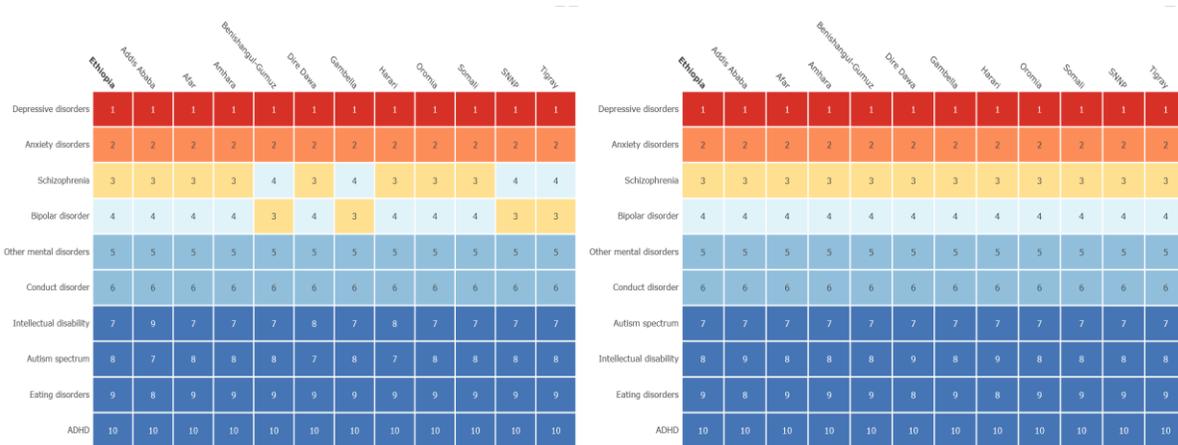


Figure 1. DALYs due to mental disorders per 100,000 population in regional states in Ethiopia, 1990-2019



DALYs-1990 rank

DALYs-2019 rank

Figure 2. Age-standardized DALYs lost due to mental disorders per 100,000 population in Ethiopia and in regional states, 1990 to 2019

Discussion

This study has described the burden of mental disorders by incidence, prevalence, and DALYs for Ethiopia's regional states and chartered cities from 1990 to 2019. Depressive disorders, anxiety disorders, bipolar disorders, and schizophrenia were the leading mental disorders. The highest DALYs were observed in the Addis Ababa city administration, followed by the

Dire Dawa city administration, whereas the lowest DALYs were observed in the Somali region. The share of DALYs was higher among females.

This study has indicated that depressive disorders, anxiety disorders, bipolar disorders, and schizophrenia were the leading mental disorders in Ethiopia from 1990-2019. However, these findings are much lower

than reports from a systematic analysis of the 2013 GBD study and the 2018 Indian study (15, 16). This may be due to the differences in socioeconomic conditions between the countries. In Ethiopia, mental health disorders are often believed to be caused by evil spirit possession or punishment from God, and the affected individuals often seek help from traditional healers and religious organizations (8). Consequently, these disorders usually remain undetected in the healthcare system (7, 8). Ethiopia's lack of recognition and treatment for mental health disorders highlights the need for increased education and awareness about mental health. Addressing cultural beliefs and practices that may hinder individuals from seeking proper medical care. Integrating traditional healers and religious organizations into the healthcare system could also help bridge the gap between Western medicine and traditional practices. Additionally, providing resources and support for mental health professionals in Ethiopia could improve the detection and treatment of mental health disorders.

This analysis has revealed that the two city administrations, Addis Ababa and Dire Dawa, had the highest DALYs due to mental disorders from 1990-2019. This is explained by the fact that the impacts of urbanization increase the risk of mental disorders through increased stressors, adjustment difficulties, polluted and overcrowded environments, high levels of violence, poverty, and reduced social support (17). On the other hand, this study has also identified the lowest DALYs due to mental disorders in the Somali region. The possible reason for this difference could be the limited availability of epidemiological data to inform the estimates and disability weight analysis and the greater uncertainty surrounding the estimates.

Most studies revealed that gender differences exist concerning mental disorders, and common mental and affective disorders are more prevalent among females than males. Our findings concur with those of other local and international studies (4, 16). A population-based longitudinal study in India found poverty, chronic physical illness, and gynecological symptoms to be the risk factors (18). It is also worth considering other risk factors, such as intimate partner violence, childhood sexual abuse and victimization, and conflict and war (19).

An important strength of this study was that it used all data sources that were readily available to estimate the national and sub-national burden of mental health disorders in Ethiopia from 1990- 2019, which improved the validity of estimates that could not be seen in individual household surveys with varied data quality. This would help compare the burden of mental disorders at sub-national levels and monitor progress. However, the country's absence of reliable mental health surveillance systems might lead to greater uncertainty. Further study is warranted to estimate the

impacts of accessibility to mental health services, stigma, conflict, and war, as well as the resources allocated to alleviate the burden of mental disorders in Ethiopia.

Conclusion

This study has indicated that depressive disorders, anxiety disorders, bipolar disorders, and schizophrenia were Ethiopia's most common mental disorders from 1990-2019, indicating unparalleled prevention and treatment efforts to halt the burdens due to these disorders. Moreover, there were variations in the distribution of the burden of mental disorders at the sub-national level. Therefore, mental health interventions should include addressing common disorders and inter-regional disparities.

Conflict of interest

We declare that we have no competing interests.

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Data availability statement: The datasets used for this study are available in the IHME data repository and can be accessed directly from <http://ghdx.647healthdata.org/gbd-results-tool>.

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Contribution of Authors: AZ, ST conceptualize and drafted the manuscript; AT, TMB, MA, AA, SB, GT, MD, MN, AM revised it critically for important intellectual content.

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