

# Prevalence of Child Mental Health Problems in Sub-Saharan Africa

## A Systematic Review

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**Objective:** To assess the prevalence of child mental health problems in community settings in sub-Saharan Africa.

**Data Sources:** A systematic search of MEDLINE, EMBASE, and PsychInfo, supplemented by tracking of references from identified articles and personal communications with local researchers.

**Study Selection:** Only community-based studies in sub-Saharan Africa that assessed the general psychopathology of children aged 0 to 16 years were included. For each eligible study, the following information was extracted: year of publication, country, population sampled, area type (rural or urban), sampling method and sample size (percentage boys), age range, assessment instrument, informant, diagnostic criteria, and prevalence rates of general psychopathology.

**Main Outcome Measure:** Pooled prevalence rate of psychopathology in children, identified by questionnaire and, specifically, by clinical diagnostic instruments.

**Results:** Eleven studies met the inclusion criteria, 10 of which were included in the meta-analysis. The 10 studies provided data for 9713 children from 6 countries, with substantial variation in assessment methods. Overall, 14.3% (95% CI, 13.6%-15.0%) of children were identified as having psychopathology. Studies using screening questionnaires reported higher prevalence rates (19.8%; 95% CI, 18.8%-20.7%) than did studies using clinical diagnostic instruments (9.5%; 8.4%-10.5%).

**Conclusions:** Evidence suggests that considerable levels of mental health problems exist among children and adolescents in sub-Saharan Africa. One in 7 children and adolescents have significant difficulties, with 1 in 10 (9.5%) having a specific psychiatric disorder. There are clear sociodemographic correlates of psychopathology that may place children in areas of greatest deprivation at greatest risk.

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**T**HE GROWING AWARENESS OF the importance of mental health as a key component in child development has begun to shape global health initiatives during the past quarter of a century.<sup>1,2</sup> It is increasingly recognized that improving children's psychosocial well-being is necessary to achieve the United Nations Millennium Development Goals.<sup>3</sup> Psychological difficulties have been shown to affect children's abilities to fulfill their potential in high-income countries.<sup>4</sup> There is, however, a paucity of research in lower-income countries, where adversity is most prevalent and the impact may be more detrimental.<sup>5-7</sup> In high-income and low- and middle-income countries, unipolar depression is 1 of the 10 leading causes of disability worldwide.<sup>8</sup> It has been estimated that the burden from depression alone is likely to increase to the single biggest burden of all health conditions by 2030.<sup>9-14</sup> In sub-Saharan Africa, rates of psychological disorders in adults are particularly elevated, and studies have

shown rates of posttraumatic stress disorder, anxiety, and depression ranging from 20% to 60%.<sup>15</sup> The 48 sub-Saharan African countries make up the greatest proportion of least-developed countries in the world<sup>16</sup> and have experienced considerable social tensions and change due to a history of oppression and violence and currently have the highest rates of human immunodeficiency virus/AIDS in the world.<sup>17</sup> Adverse conditions during childhood may interfere with children's fundamental physical, emotional, and social development and place them at risk for psychological problems.<sup>18-25</sup> There has been little research in child mental health in low- and middle-income countries,<sup>26</sup> but the World Health Organization estimates that as many as 20% of the world's children and adolescents experience a mental disorder at some stage in their childhood.<sup>27,28</sup> This review aimed to systematically examine all available studies assessing the prevalence of psychopathology in children and adolescents in sub-Saharan Africa.

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## SEARCH STRATEGY

A systematic literature search was conducted of the MEDLINE, EMBASE, and PsychInfo databases to identify peer-reviewed journal articles that investigated the general prevalence of psychological problems in sub-Saharan Africa published up until the start of 2010. A multistage search strategy was used. First, the keywords *child\**, *children\**, *infant\**, *paediatric\**, or *adolescent\** were used to identify the age group of interest. The following combinations of keywords relating to psychiatric illness were used: *mental\**, *mentally*, *psychologically*, *psychological*, *psychiatric*, *psychiatry*, *mental disease*, and *mental health*. The Medical Subject Heading terms *child psychiatry* and *child psychology* were also used. To identify epidemiologic prevalence studies, the following keywords were used: *prevalence*, *incidence*, *epidemiology*, *cross-sectional study*, and *population research*. In the initial search, all studies conducted in low- and middle-income countries were of interest. The keywords *developing nation*, *third world*, *developing country*, and *Africa* were used. Reference lists were examined for other potential studies, and experts in the field were contacted to ensure that any additional studies that might be relevant to the search were identified.

Developing countries were defined according to the Organisation for Economic Co-operation and Development,<sup>16</sup> which is in accord with the World Bank classification of low- and middle-income countries. Of these, only sub-Saharan African countries were included. No limits were set on language.

## STUDY SELECTION

In cases in which the titles and abstracts provided insufficient information, the entire publication was retrieved and examined. Studies in which participants were aged 0 to 16 years and were defined by the Organisation for Economic Co-operation and Development as developing low- and middle-income countries and reported a general prevalence of disorders or multiple disorders were included. This age range was used because several commonly used measures of psychopathology are designed for children up to age 16 years.<sup>29,30</sup> Studies with age ranges exceeding 16 years were examined and included if the analyses included a breakdown by age. Only population- or community-based studies with a sample size exceeding 100 were included. Studies examining only 1 specific disorder (such as posttraumatic stress disorder or eating disorders) were excluded as we sought to estimate total rates of psychological disturbances.

## DATA ANALYSIS

The random-effects method was used to estimate pooled prevalence.<sup>31</sup> This method is based on the inverse variance method<sup>32</sup> but accounts for heterogeneity among the studies and results in a different pooled prevalence estimate and a larger CI for the pooled prevalence. This method takes into account the different disease-related characteristics of the samples, allowing for the estimation of a population of prevalence values with a normal distribution, fixed mean, and variance as opposed to a specific global, underlying prevalence. That is, there is not a single source of variability between studies due to sampling error and measured by the within-study variance, but there is an additional variability due to different underlying prevalence values and measured by the between-study variance.

Prevalence rates of general psychopathology were also combined by direct summation of numerators and denominators across studies to provide weighted averages; however, this method does not account for heterogeneity.<sup>33</sup> In studies that

included more than 1 screening measure,<sup>34,35</sup> the most commonly used measure (the Reporting Questionnaire for Children) was used for comparison. In studies that used a screening questionnaire and a diagnostic interview, the prevalence from the diagnostic interview was used to calculate the overall weighted average as it is more conservative.<sup>36</sup> Because screening tools and diagnostic interviews can yield different estimates, separate weighted averages were calculated for studies using screening instruments vs diagnostic interviews. Weighted averages were also calculated separately for boys and girls. One study<sup>36</sup> did not report scores by sex but provided rates by sex for the diagnostic tool used; therefore, those rates were used to calculate the sex-weighted prevalence. Separate weighted averages were calculated for rural and urban samples to determine whether there was a difference in rates in the 2 areas.

## RESULTS

## STUDY CHARACTERISTICS

The database search yielded 1213 potentially relevant citations. The previously mentioned inclusion and exclusion criteria initially yielded 10 relevant articles.<sup>34-43</sup> A further search of reference lists and contact with experts in the field revealed 1 additional article that met the inclusion criteria.<sup>44</sup> Eleven relevant publications were included in this review.<sup>34-44</sup> However, 1 study<sup>42</sup> that yielded particularly high prevalence rates (71%) was excluded as an outlier from the meta-analysis. For each eligible study, the following information was extracted: year of publication, country of study, population sampled, area type (rural or urban), sampling method and sample size (percentage male), age range, assessment instrument, identity of informant, diagnostic criteria, and prevalence rates of general psychopathology.

The studies differed in sample size, methods, assessment method, score, and location. They were published at varying times, ranging from 1977 to 2008 with the majority published after 1992. The 10 studies included in this meta-analysis comprised 9713 children, with sample sizes ranging from 148 to 1187 and ages ranging from 5 to 16 years. Studies were conducted in 6 different African countries: 3 studies from Ethiopia,<sup>34,38,43</sup> 2 from Nigeria,<sup>35,37</sup> 1 from Kenya,<sup>44</sup> 3 from South Africa,<sup>36,40,42</sup> 1 from Uganda,<sup>41</sup> and 1 from the Democratic Republic of Congo.<sup>39</sup> Most studies used screening measures,<sup>34,36,37,39,41-43,45</sup> and 4 used methods for determining psychiatric diagnoses.<sup>35,36,38,40</sup> Six studies<sup>35,37,38,41-43</sup> were conducted in rural populations, and 5 were conducted in urban populations.<sup>34,36,39,40,44</sup> One study<sup>41</sup> reported findings from 3 different populations (a primary school, a reform school, and an outpatient clinic), but only the primary school was included in the analyses as this was closest to a community sample. The studies varied by informant, with some using the parent or guardian, some using teachers, some using the children, and some using multiple informants. Although many of the instruments used are well validated in the high-income countries in which they were developed, most of the scales used were translated and back translated for use in the respective studies and were not previously validated for use in the study sites. One study used a culturally derived instrument.<sup>44</sup> Summaries of the studies can be found in the **Table**.<sup>34-44,46\*</sup>

**Table. Summary of Included Articles**

| Source   | Location (Area Type)                            | Sampling Method                  | Sample Size, No. (% Male) | Participant Age Range, y | Instrument                  | Informant        | Participants With Disorder, No. (%) |                          |                                 |
|--|---|----------------------------------|---------------------------|--------------------------|-----------------------------|------------------|-------------------------------------|--------------------------|---------------------------------|
|  |   |                                  |                           |                          |                             |                  | Boys                                | Girls                    | Total                           |
| <b>Studies Using Diagnostic Methods for Assessment</b> |   |                                  |                           |                          |                             |                  |                                     |                          |                                 |
| Abiodun, <sup>35</sup> 1992                            | Essie, Nigeria (Rural)                          | Random                           | 500                       | 5-15                     | RQC                         | Unknown          | NA                                  | NA                       | NR                              |
|  |   |                                  | Subsample of 200          |                          | RTQ<br>FIC                  | Teacher<br>Child |                                     | NR                       | 30 (15.0) <sup>a</sup>          |
| Robertson et al, <sup>36</sup> 1999                    | Khayelitsha, South Africa (Urban)               | Systematic strategy <sup>b</sup> | 500 (45.5)                | 10-16                    | DISC-2.3 <sup>c</sup>       | Parent and child | 21 (9.2) <sup>d</sup>               | 16 (5.9)                 | 76 (15.2)                       |
| Liang et al, <sup>40</sup> 2002                        | Khayelitsha, South Africa (Urban)               | Multistage                       | 500 (54.5)                | 6-16                     | RQC <sup>e</sup><br>DISC-IV | Parent and child | 30 (11.0)                           | 50 (22.0)                | 324 (64.8)<br><b>80</b> (16.0)  |
| Ashenafi et al, <sup>38</sup> 2001                     | Butajira district, Ethiopia (86% Rural)         | Systematic                       | 1477 (51.0)               | 5-14                     | DICA                        | Parent           | 23 (3.1)                            | 29 (4.0)                 | <b>52</b> (3.5)                 |
| <b>Studies Using Screening Tools for Assessment</b>    |   |                                  |                           |                          |                             |                  |                                     |                          |                                 |
| Adelekan et al, <sup>37</sup> 1999                     | Nigeria (Rural)                                 | Stratified                       | 846 (53.0)                | NR, primary schools 1-6  | RTQ                         | Parent           | NA                                  | NA                       | 157 (18.6)                      |
| Mulatu, <sup>34</sup> 1995                             | Jimma town, Ethiopia (Rural)                    | Randomly selected                | 611 (51.9)                | 6-11                     | RQC <sup>f</sup>            | Mother/guardian  | 92 (29.0)                           | 73 (24.8)                | <b>165</b> (27.0)               |
| Tadesse et al, <sup>43</sup> 1999                      | Ambo district, Ethiopia (Both [mostly rural])   | Stratified random sample         | 3001 (49.4)               | 5-15                     | CBPQ <sup>g</sup><br>RQC    | Parent/caretaker | 317 (21.5)<br>284 (19.2)            | 294 (25.2)<br>247 (16.4) | 142 (23.2)<br><b>531</b> (17.7) |
| Minde, <sup>41</sup> 1977                              | Uganda (Mostly rural)                           | Strategic                        | 577                       | 7-15                     | RTQ                         | Teacher          | NA                                  | NA                       | 105 (18.2)                      |
| Kashala et al, <sup>39</sup> 2005                      | Kinshasha, Democratic Republic of Congo (Urban) | Random                           | 1187 (42.0)               | 7-9                      | SDQ                         | Teacher          | 51 (10.0)                           | 85 (12.0)                | <b>136</b> (11.5)               |
| Ndetei et al, <sup>44</sup> 2008                       | Kenya (Urban)                                   | Stratified random                | 514                       | 13-16 <sup>h</sup>       | NOK                         | Child            | 8 (3.2)                             | 6 (3.1)                  | <b>14</b> (2.7)                 |
| <b>Study Excluded From the Analyses</b>                |   |                                  |                           |                          |                             |                  |                                     |                          |                                 |
| Peltzer, <sup>42</sup> 1999                            | Dikgale, South Africa (Rural)                   | Stratified random                | 148 (46.0)                | 6-16                     | RQC                         | Caregiver        | NA                                  | NA                       | 105 (70.9)                      |

Abbreviations: CBPQ, Child Behavior Problem Questionnaire; DICA, Diagnostic Interview for Children and Adolescents; DISC, Diagnostic Interview Schedule for Children; DSM-III-R, Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised; FIC, Follow-up Interview for Children; NA, not applicable; NOK, Ndetei-Othieno-Kathuku Scale for Anxiety and Depression; NR, not reported; RQC, Reporting Questionnaire for Children; RTQ, Rutter Teacher Questionnaire; SDQ, Strengths and Difficulties Questionnaire (French version).

<sup>a</sup>Excluding enuresis from the total, there were 25 cases (5%) represented, including conduct disorder (n = 6), disturbances of emotion specific to childhood (n = 14), mental retardation (n = 3), speech and language disorder (n = 1), and hyperkinetic syndrome (n = 1).

<sup>b</sup>Eighteen routes were determined using aerial photographs and street maps, and a random sample of one-third of the routes was then selected. Every fifth dwelling was visited using a random starting point on each block.

<sup>c</sup>Xhosa version.

<sup>d</sup>This rate excludes enuresis. Including enuresis, rates are higher for boys (18.1%) and girls (12.5%).

<sup>e</sup>This screening questionnaire was used in addition to diagnostic assessment. The lower rate determined through diagnostic methods was used in the meta-analysis.

<sup>f</sup>This World Health Organization questionnaire is a 10-item screening instrument designed to identify psychiatric difficulties in children.<sup>34</sup>

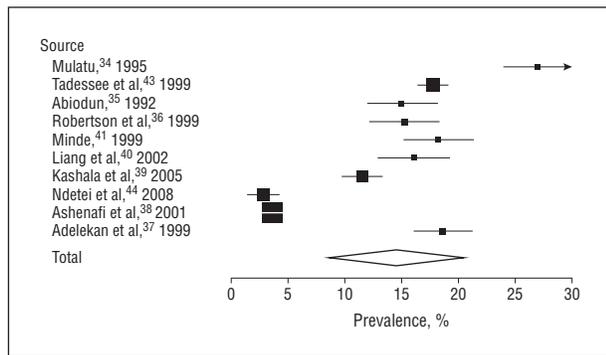
<sup>g</sup>A list of 64 items to assess behavioral and psychological problems, such as aggression, depression, social withdrawal, hyperactivity, anxiety, and somatic symptoms taken from the Child Behavior Checklist.<sup>46</sup>

<sup>h</sup>The sample included up to age 21 years, but analyses were split by age; therefore, only ages 13 to 16 years were included.

### PREVALENCE RATES OF GENERAL PSYCHOLOGICAL DIFFICULTIES

Overall prevalence rates of general psychological difficulties ranged from 2.7% to 71% across the studies (**Figure**).<sup>38,40,42,45\*</sup> The outlying study<sup>42</sup> (with a prevalence of 71%) was excluded from the meta-analysis. A

total weighted average of 14.3% (95% CI, 13.6%-15.0%) was calculated across the studies for the total sample of 9713 children. This value increased to 14.5% (95% CI, 8.6%-20.4%) when heterogeneity was taken into account. Only 7 of the 11 studies reported rates by sex.<sup>34,36,38-40,43,44</sup> The weighted average for boys (n = 4235) was 12.5% (95% CI, 12.5%-13.5%) and for girls (n = 4537)



**Figure.** Weighted prevalence rates for the total sample, accounting for heterogeneity.<sup>38,40,42,45</sup>

was 12.3% (95% CI, 11.3%-13.3%). The weighted average for the rural studies (n=6401) was 14.4% (95% CI, 13.5%-15.2%), which included 2 articles with mostly rural samples.<sup>35,37,38,41-43</sup> The rate for urban studies (n=3312) was comparable (14.2%; 95% CI, 13.0%-15.4%). Rates of psychopathology measured via screening questionnaires (n=7236) were higher (19.8%; 95% CI, 19.8%-20.7%) than those found using diagnostic tools (9.5%; 95% CI, 8.4%-10.5%; n=2977).

## ASSESSMENT METHODS

The most commonly used instrument was the Reporting Questionnaire for Children, and the second most common scale used was the Rutter Teacher Questionnaire. The other screening instruments included the Child Behavior, the Strengths and Difficulties Questionnaire, and the newly designed Ndetei-Othieno-Kathuku Scale for Anxiety and Depression. Most of these studies relied on either parent or teacher reports of a child's difficulties. Studies that reported psychiatric diagnoses used the Diagnostic Interview Schedule for Children Version IV, the Follow-up Interview for Children, the Diagnostic Interview Schedule for Children Version 2.3, and the Diagnostic Interview for Children and Adolescents.

## SPECIFIC DISORDERS

Although the purpose of this review was to determine rates of overall psychopathology in sub-Saharan Africa, some articles also reported rates of specific disorders. The most commonly identified disorders were emotional problems (including depression);<sup>35,36,38,40</sup> anxiety disorders<sup>36,38,40,45</sup>; conduct, disruptive, and reactive behavior disorders<sup>35,36,38,40,41</sup>; and posttraumatic stress disorder.<sup>34-37,39,41-43,45</sup>

## COMMENT

The principal finding of this review is that child and adolescent mental health problems are common in sub-Saharan Africa. An overall adjusted prevalence of 14.5% was determined for general psychopathology in children and adolescents up to age 16 years. The prevalence rates of general psychological difficulties reported in this review varied greatly across the included studies (2.7%-27.0%). Most of the studies reviewed used screening mea-

asures, which generally yield higher prevalence rates (19.8%) than do clinical diagnostic tools (9.5%). This is unsurprising as screening tools measure general symptoms and do not necessarily address severity and the impact of symptoms, unlike clinical diagnostic tools. The rates found seem to be comparable with rates from the small number of studies in other low- and middle-income countries, which have been found to range from 12% to 29%,<sup>47</sup> and also those from high-income nations.<sup>5</sup> For example, in the Great Smoky Mountains Study,<sup>48</sup> rates of psychiatric disorders (as identified using a diagnostic interview) were found to be 20.3% (95% CI, 18.6%-22.0%) in 9-, 11-, and 13-year-olds and as low as 10% in the United Kingdom, reaching 16% in the poorest households.<sup>49</sup>

We found no evidence of a difference in prevalence rates of disturbance between boys and girls. This may be, in part, due to the broad age range and also range of mental health difficulties assessed in this review. Previous research has shown that boys tend to have higher rates of behavioral disorders, whereas girls tend to display more emotional disorders<sup>50,51</sup>; therefore, comparison of overall rates by sex may not provide enough detailed information, hence accounting for the lack of observed difference.

We found comparable rates of psychological difficulties in rural and urban community settings in this review. There is mixed evidence from other studies regarding this outcome, although one of the common attributions of higher psychiatric morbidity in urban areas than in rural areas is greater exposure to violence.<sup>52-54</sup> One study<sup>55</sup> in 3 areas in Bangladesh (rural, urban, and slum) found comparable prevalence rates in the rural and urban areas but significantly higher rates in the slum area, suggesting that poverty or violence may be a key factor.

This review also highlights the dearth of culture-specific or validated tools for assessing psychopathology. However, the use of local, culturally derived tools presents problems when trying to establish rates of disorder across different settings. Of the 11 studies in this review, only 1 used a locally derived instrument,<sup>44</sup> and only 1 examined the psychometric properties of the non-locally derived scale it used.<sup>39</sup> This suggests a relative paucity of psychometric studies for questionnaires developed in higher-income settings when used in sub-Saharan Africa.

Although analysis of specific risk and protective factors is beyond the scope of this review, many of the studies included identified risk and protective factors that are broadly similar to those identified in high-income settings.<sup>56</sup> The most significant risk factors for the development of psychopathology in children and adolescents were maternal psychopathology, disruption of the family and marital status, exposure to stressful events, maternal age, and poverty-related factors (such as insufficient food, low socioeconomic status, and illness). Two studies found that children's age was significantly associated with mental disorder, with older children being more at risk, although this may reflect the age at symptom onset rather than actual increased risk.<sup>36,43</sup> Overall, the findings draw attention to the increased risk for children in areas of greatest deprivation, a significant con-

cern given the high rates of deprivation experienced by many children in sub-Saharan Africa.

This review has several strengths that should be highlighted. To our knowledge, it is the first review to assess rates of psychopathology in children across sub-Saharan Africa and to compare methods of assessment and populations. We were able to delineate rates using screening tools and clinical assessments.

There are several important limitations to consider in this review. First, sub-Saharan Africa is a diverse continent, and there is considerable variation between and within countries and communities in terms of history, culture, living conditions, and availability of health care. Of the 48 sub-Saharan African countries, this review identified studies conducted in only 6 countries, indicating a dearth of research across the region. Therefore, care should be taken in extrapolating the results to other countries and settings in the sub-Saharan region. Second, although risk factors for psychological disorders were considered, none of the studies included information on potential protective or resilience factors, which could have illuminated differences in rates of psychological difficulties. Third, in common with most systematic reviews, publication bias must be considered, although thorough and systematic searches were conducted and were supplemented with direct contact with local researchers in the field. It remains possible that some studies, particularly those with unexpected or unremarkable findings, remain unpublished.

In conclusion, competent planning of health services, including mental health services, requires an accurate assessment of the health needs of the population. This systematic review has shown that there are significant levels of mental health problems in children and adolescents in sub-Saharan Africa. Difficulties are identified in 1 in 7 children and adolescents, and, when using narrower diagnostic criteria, 1 in 10 children (9.5%) had an identified psychiatric disorder. These rates are broadly comparable with those of the relatively few studies conducted elsewhere in low- and middle-income countries<sup>5,57,58</sup> and suggest that the next generation faces significant mental health difficulties in addition to the other health challenges facing sub-Saharan Africa. It is clear from the relative lack of child and adolescent mental health research in this region that further detailed study is needed, grappling with some of the complex methodological issues inherent in this work. What is perhaps most clear is that significant, and usually unaddressed, mental health problems exist in sub-Saharan Africa, and mental health needs should be a critical component of overall health care planning.<sup>1,2,27</sup>

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