### Scaling-up services for psychosis, depression and epilepsy in Sub-Saharan Africa and South Asia: development and application of a mental health systems planning tool (OneHealth)

**WEB APPENDIX Table A Intervention effect size estimates for MND disorders module**

DEPRESSION

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Intervention | mhGAP-IG ref | Impacts on | Efficacy  (% improvement) | Adherence (%) | Effectiveness *(Efficacy \* adherence)* | Data source(s) |
| Basic psychosocial treatment & anti-depressant medication | DEP2 & DEP3 | Remission | **35%** [from a remission of 2.0 to 2.7 (per 1 person)] | **60%** | **21%**  (35%\*60%) | Chisholm et al, *Br J Psychiatry* 2004 |
| Intensive psychosocial treatment & anti-depressant medication | DEP3 & INT | Remission | **35%** [from a remission of 2.0 to 2.7 (per 1 person)] | **70%** | **24.5%**  (35%\*70%) | Chisholm et al, *Br J Psychiatry* 2004 |
| Psychosocial treatment for peri-natal depression |  | Remission | **30%** [relative risk of 0.7, or moving from a remission of 2.0 to 2.6 (per 1 person) | **80%** | **24%**  (30%\*80%) |  |

PSYCHOSIS

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Intervention | mhGAP-IG ref | Impacts on | Efficacy  (% improvement) | Adherence (%) | Effectiveness *(Efficacy \* adherence)* | Data source(s) |
| Basic psychosocial support & anti-psychotic medication | PSY2 & PSY3 | Functioning (reduced disability) | **8.4%** [from a disability weight of 0.627 to 0.574] | **70%** | **5.9%**  8.4%\*70%) | Chisholm et al, *WHO Bulletin* 2008 |
| Intensive psychosocial support & anti-psychotic medication | DEP3 & INT | Functioning (reduced disability) | **14.3%** [from a disability weight of 0.627 to 0.537] | **70%** | **10.0%**  (14.3%\*70%) | Chisholm et al, *WHO Bulletin* 2008 |

EPILEPSY

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Intervention | mhGAP-IG ref | Impacts on | Efficacy  (% improvement) | Adherence (%) | Effectiveness *(Efficacy \* adherence)* | Data source(s) |
| Basic psychosocial support & anti-epileptic medication | EPI2 | Remission | **60%** [0.09 to 0.05 (per 1 person), adjusted for 25% non-response] | **70%** | **42.0%**  (60%\*70%) | Chisholm et al, *Epilepsia* 2005 |
| EPI2 | Functioning (reduced disability) | **57%** [from a disability weight of 0.3 to 0.13, adjusted for 25% non-response] | **70%** | **39.9%**  (57%\*70%) | Chisholm et al, *Epilepsia* 2005 |

**Web Appendix Table B Total drugs and supplies costs (US$)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Country | Disorder | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total |
| Ethiopia | Depression | $48,953 | $332,832 | $624,719 | $924,167 | $1,230,798 | $1,544,406 | $1,865,582 | $6,571,458 |
|  | Psychosis | $62,325 | $209,321 | $358,039 | $507,761 | $657,668 | $806,841 | $954,348 | $3,556,303 |
|  | Epilepsy | $10,199,019 | $14,196,875 | $18,235,852 | $22,330,568 | $26,494,718 | $30,717,772 | $35,003,953 | $157,178,757 |
|  | Total | **$10,310,297** | **$14,739,028** | **$19,218,610** | **$23,762,496** | **$28,383,183** | **$33,069,019** | **$37,823,883** | **$167,306,517** |
| India | Depression | $4,095,448 | $3,150,874 | $3,981,083 | $5,059,723 | $6,279,568 | $7,576,342 | $10,104,493 | $40,247,532 |
|  | Psychosis | $1,163,219 | $1,146,274 | $1,471,055 | $1,785,299 | $2,085,278 | $2,368,588 | $2,954,006 | $12,973,719 |
|  | Epilepsy | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
|  | Total | **$5,258,667** | **$4,297,149** | **$5,452,138** | **$6,845,022** | **$8,364,846** | **$9,944,930** | **$13,058,499** | **$53,221,251** |
| Nepal | Depression | $249,938 | $491,533 | $732,490 | $970,950 | $1,205,634 | $1,435,816 | $1,661,202 | $6,747,563 |
|  | Psychosis | $1,216,607 | $1,571,802 | $1,949,231 | $2,349,649 | $2,773,807 | $3,222,351 | $3,695,899 | $16,779,346 |
|  | Epilepsy | $3,065,621 | $3,619,745 | $4,170,689 | $4,714,166 | $5,246,278 | $5,760,635 | $6,253,756 | $32,830,890 |
|  | Total | **$4,532,166** | **$5,683,080** | **$6,852,410** | **$8,034,764** | **$9,225,720** | **$10,418,801** | **$11,610,856** | **$56,357,798** |
| Nigeria | Depression | $3,023,818 | $8,470,229 | $16,784,590 | $28,147,846 | $42,745,997 | $- | $- | $99,172,481 |
|  | Psychosis | $2,107,649 | $4,486,390 | $7,855,520 | $12,299,368 | $17,905,856 | $- | $- | $44,654,783 |
|  | Epilepsy | $16,883,786 | $38,125,719 | $68,115,271 | $107,087,938 | $155,325,559 | $- | $- | $385,538,272 |
|  | Total | **$22,015,253** | **$51,082,338** | **$92,755,382** | **$147,535,153** | **$215,977,412** | **$-** | **$-** | **$529,365,537** |
| South Africa | Depression | $1,468,526 | $1,705,021 | $1,946,411 | $2,195,634 | $2,451,461 | $2,714,267 | $2,983,697 | $16,741,035 |
|  | Psychosis | $875,267 | $1,054,830 | $1,237,681 | $1,423,383 | $1,611,551 | $1,806,268 | $2,011,674 | $10,719,766 |
|  | Epilepsy | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
|  | **Total** | **$2,343,792** | **$2,759,851** | **$3,184,093** | **$3,619,017** | **$4,063,012** | **$4,520,535** | **$4,995,372** | **$27,460,801** |
| Uganda | Depression | $690,765 | $1,136,975 | $1,557,131 | $1,947,980 | $2,306,685 | $- | $- | $7,639,536 |
|  | Psychosis | $415,581 | $602,168 | $786,656 | $967,454 | $1,142,818 | $- | $- | $3,914,678 |
|  | Epilepsy | $1,988,803 | $2,414,554 | $2,853,554 | $3,309,564 | $3,789,023 | $- | $- | $14,355,499 |
|  | **Total** | **$3,095,150** | **$4,153,696** | **$5,197,342** | **$6,224,998** | **$7,238,526** | **$-** | **$-** | **$25,909,713** |

**Web Appendix Table C Cost of outpatient and ambulatory care (US$)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Country | Disorder | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total |
| Ethiopia | Depression | $6,439 | $22,773 | $41,056 | $61,428 | $84,032 | $109,011 | $136,521 | $461,260 |
|  | Psychosis | $23,807 | $268,655 | $527,135 | $799,290 | $1,085,189 | $1,384,998 | $1,699,651 | $5,788,724 |
|  | Epilepsy | $139,174 | $195,726 | $254,006 | $314,255 | $376,706 | $441,250 | $507,987 | $2,229,105 |
|  | Total | **$169,420** | **$487,155** | **$822,197** | **$1,174,972** | **$1,545,927** | **$1,935,259** | **$2,344,160** | **$8,479,089** |
| India | Depression | $2,400,659 | $3,088,415 | $3,735,371 | $4,304,677 | $4,770,652 | $5,107,740 | $5,289,894 | $28,697,409 |
|  | Psychosis | $927,998 | $1,242,694 | $1,596,561 | $1,992,994 | $2,435,612 | $2,928,249 | $3,475,053 | $14,599,159 |
|  | Epilepsy | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
|  | Total | **$3,328,657** | **$4,331,109** | **$5,331,931** | **$6,297,671** | **$7,206,264** | **$8,035,989** | **$8,764,947** | **$43,296,568** |
| Nepal | Depression | $1,140,871 | $2,298,207 | $3,511,435 | $4,777,164 | $6,094,733 | $7,466,425 | $8,897,256 | $34,186,090 |
|  | Psychosis | $476,008 | $624,235 | $786,526 | $964,248 | $1,158,996 | $1,372,568 | $1,607,051 | $6,989,632 |
|  | Epilepsy | $633,546 | $784,007 | $949,348 | $1,130,973 | $1,330,576 | $1,549,424 | $1,789,677 | $8,167,550 |
|  | Total | **$2,250,424** | **$3,706,449** | **$5,247,309** | **$6,872,383** | **$8,584,304** | **$10,388,417** | **$12,293,984** | **$49,343,272** |
| Nigeria | Depression | $24,720,677 | $38,006,463 | $52,102,053 | $66,989,865 | $82,686,481 | $- | $- | $264,505,539 |
|  | Psychosis | $4,205,069 | $8,066,367 | $13,349,693 | $20,174,538 | $28,665,537 | $- | $- | $74,461,205 |
|  | Epilepsy | $14,039,337 | $25,774,337 | $40,754,255 | $59,080,290 | $80,868,525 | $- | $- | $220,516,745 |
|  | Total | **$42,965,083** | **$71,847,166** | **$106,206,002** | **$146,244,694** | **$192,220,544** | **$-** | **$-** | **$559,483,488** |
| South Africa | Depression | $72,656,028 | $86,102,595 | $100,876,470 | $116,914,760 | $134,256,370 | $153,025,654 | $174,724,837 | $900,762,946 |
|  | Psychosis | $22,104,362 | $27,614,020 | $28,747,123 | $34,861,717 | $41,721,238 | $49,406,258 | $60,063,553 | $284,321,363 |
|  | Epilepsy | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
|  | **Total** | **$94,760,390** | **$113,716,615** | **$129,623,593** | **$151,776,477** | **$175,977,609** | **$202,431,912** | **$234,788,390** | **$1,185,084,308** |
| Uganda | Depression | $1,177,316 | $1,778,480 | $2,193,514 | $2,410,486 | $2,418,215 | $- | $- | $9,978,009 |
|  | Psychosis | $232,991 | $356,829 | $482,619 | $616,279 | $759,283 | $- | $- | $2,448,001 |
|  | Epilepsy | $710,607 | $865,079 | $1,025,653 | $1,193,238 | $1,368,733 | $- | $- | $5,163,311 |
|  | **Total** | **$2,120,914** | **$3,000,388** | **$3,701,786** | **$4,220,002** | **$4,546,231** | **$-** | **$-** | **$17,589,321** |

**Web Appendix Table D Cost of inpatient days (US$)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Country | Disorder | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total |
| Ethiopia | Depression | $13,307 | $238,575 | $474,382 | $720,637 | $977,275 | $1,244,325 | $1,522,501 | $5,191,002 |
|  | Psychosis | $25,196 | $76,978 | $117,733 | $145,860 | $159,672 | $157,396 | $137,198 | $820,033 |
|  | Epilepsy | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
|  | **Total** | **$38,502** | **$315,553** | **$592,115** | **$866,497** | **$1,136,948** | **$1,401,720** | **$1,659,700** | **$6,011,035** |
| India | Depression | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
|  | Psychosis | $51,824,184 | $66,103,928 | $80,894,731 | $96,184,840 | $111,961,572 | $128,210,637 | $144,919,908 | $680,099,799 |
|  | Epilepsy | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
|  | **Total** | **$51,824,184** | **$66,103,928** | **$80,894,731** | **$96,184,840** | **$111,961,572** | **$128,210,637** | **$144,919,908** | **$680,099,799** |
| Nepal | Depression | $1,462,295 | $2,926,158 | $4,438,364 | $5,990,075 | $7,575,451 | $9,191,737 | $10,838,804 | $42,422,884 |
|  | Psychosis | $878,626 | $1,144,979 | $1,431,295 | $1,737,963 | $2,065,386 | $2,413,872 | $2,783,749 | $12,455,868 |
|  | Epilepsy | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
|  | **Total** | **$2,340,920** | **$4,071,137** | **$5,869,659** | **$7,728,039** | **$9,640,837** | **$11,605,608** | **$13,622,553** | **$54,878,753** |
| Nigeria | Depression | $27,767,752 | $42,426,654 | $57,799,896 | $73,851,983 | $90,585,438 | $- | $- | $292,431,723 |
|  | Psychosis | $143,715,801 | $203,944,469 | $267,825,026 | $335,466,371 | $406,986,534 | $- | $- | $1,357,938,201 |
|  | Epilepsy | $0 | $0 | $0 | $0 | $0 | - | - | $0 |
|  | **Total** | **$171,483,553** | **$246,371,122** | **$325,624,922** | **$409,318,354** | **$497,571,973** | **$-** | **$-** | **$1,650,369,924** |
| South Africa | Depression | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
|  | Psychosis | $1,538,970 | $1,787,024 | $1,964,853 | $2,065,926 | $2,084,008 | $2,013,331 | $1,848,010 | $14,529,154 |
|  | Epilepsy | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
|  | **Total** | **$1,538,970** | **$1,787,024** | **$1,964,853** | **$2,065,926** | **$2,084,008** | **$2,013,331** | **$1,848,010** | **$14,529,154** |
| Uganda | Depression | $670,694 | $979,367 | $1,152,412 | $1,178,674 | $1,046,949 | $- | $- | $5,028,096 |
|  | Psychosis | $519,525 | $757,348 | $996,501 | $1,235,474 | $1,472,602 | $- | $- | $4,981,450 |
|  | Epilepsy | $0 | $0 | $0 | $0 | $0 | - | - | $0 |
|  | **Total** | **$1,190,219** | **$1,736,715** | **$2,148,914** | **$2,414,148** | **$2,519,550** | **$-** | **$-** | **$10,009,546** |

**Web Table E Programme costs (US$)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total |
| Ethiopia | $274,838 | $452,687 | $528,498 | $1,092,864 | $1,470,666 | $1,953,657 | $2,276,300 | $8,049,510 |
| India | $17,583,000 | $17,233,000 | $17,233,000 | $17,233,000 | $17,233,000 | $14,695,000 | $14,430,000 | $115,640,000 |
| Nepal | $- | $119,872 | $135,897 | $138,910 | $139,487 | $138,910 | $- | $673,077 |
| Nigeria | $3,826,692 | $4,588,384 | $5,380,582 | $6,241,651 | $6,222,730 | $- | $- | $26,260,039 |
| South Africa | $4,013,297 | $6,163,126 | $9,230,405 | $12,901,051 | $16,726,496 | $19,883,793 | $20,515,360 | $93,105,166 |
| Uganda | $336,342 | $692,582 | $677,790 | $680,237 | $682,945 | $- | $- | $3,069,896 |

**References**

**Chisholm D** (2005). Cost-effectiveness of first-line anti-epileptic drug treatments in the developing world: a population-level analysis. *Epilepsia* **46**, 751–759.

**Chisholm D, Sanderson K, Ayuso-Mateos JL, Saxena S** (2004). Reducing the global burden of depression: a population-level analysis of intervention cost-effectiveness in 14 epidemiologically-defined sub-regions (WHO-CHOICE). *British Journal of Psychiatry* **184**, 393–403.

**Chisholm D, Gureje O, Saldivia S, Villalón Calderón M, Wickremasinghe R, Mendis N, Ayuso-Mateos JL, Saxena S** (2008). Schizophrenia treatment in the developing world: an inter-regional and multi-national cost-effectiveness analysis. *Bulletin of the World Health Organization* **86**, 542–551.