### 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.