**Supplementary Table 1: Raw data sheet.**

| Author          | Year | Country | Criteria (Cut-Off) | Sample Size | Cognitively Impaired (ANI, MND, HAD in %) | Mean Age (SD) or Median (IQR), Range | ART Coverage (%) | Male (%) | Exclusion Criteria for Study Participants | Recruitment Year(s) / Time of Testing | Cohort / Place of Recruitment | NOS Score |
|-----------------|------|---------|-------------------|-------------|------------------------------------------|-------------------------------------|------------------|----------|----------------------------------------|-----------------------------------|--------------------------------|-----------|
| Arentoft et al. | 2015 | USA     | Frascati          | 134         | 68 (56, 5, 7)                            | 47.6 (8.1)                          | 90.6             | 70       | yes                                    | .                                 | community outreach in NYC (East Harlem), Icahn School of Medicine at Mount Sinai | 7         |
| Agarwal et al.  | 2020 | India   | MoCA (26)         | 160         | 52.5                                     | 44 (10)                             | 50               | 75.6     | yes                                    | .                                 | Chandra Laxmi Hospital, Vaishali, Ghaziabad | 7         |
| Akena et al.    | 2010 | Uganda  | MMSE              | 64          | 70.3                                     | 32 (6.5)                            | .                | 21.9     | no, only depression included            | 2007                              | mental health units of Mulago general hospital and Butabika psychiatric hospital | 6         |
| Akolo et al.    | 2014 | Nigeria | GDS               | 133         | 30.8                                     | 33.6 (7.3)                          | 0                | 42.1     | yes                                    | .                                 | National Hospital (NH) & University of Abuja Teaching Hospital (UATH) | 8         |
| Alford et al.   | 2019 | UK      | Frascati (uncategorised) | 52 | 31                                           | 55‘median’, 36-64 | 98      | 79       | no, BUT score is adjusted               | 2016-2018                          | The Orange Clinic, Brighton (memory clinic) | 6         |
| Animit et al.   | 2019 | Ethiopia| IHDS (9.5)        | 684         | 67.1                                     | 38.8 (8.8)                          | 100              | 44       | only neurological disorders & psychiatric disorders excluded | 2017                              | Gamo Gola zone                          | 8         |
| Araya et al.    | 2020 | Ethiopia| IHDS (9.5)        | 581         | 35.6                                     | 38 (9.8)                           | 100              | 38.7     | no                                     | 2018                              | four federal hospitals in Addis Ababa | 7         |
| Arenas-Pinto et al. | 2014 | UK     | Frascati (uncategorised) | 548 | 52                                           | 44 (9)                            | 100              | 76       | unspecified                             | 2008-2010                          | Protease Inhibitor monotherapy Versus Ongoing Triple-therapy (PIVOT) trial | 8         |
| Asiedu, Kretchy & Asampong | 2020 | Ghana | IHDS               | 104         | 48                                        | 37.2 (10.1)                         | 100              | 21.2     | only psychiatric disorders & head injuries excluded | 2017                              | Ridge Hospital in Accra                 | 7         |
| Atashili et al. | 2013 | Cameroon| IHDS (10)         | 400         | 85                                        | 41 (34-47)                          | 100              | 26       | unspecified                             | 2010                              | Bamenda Regional Hospital AIDS Treatment Centre | 7         |
| Atkins et al.   | 2010 | Canada  | clinical NP ratings | 357       | 48.5                                     | 41.5, 19-64                        | 70               | 100      | unspecified                             | .                                 | St. Michael’s Hospital in Toronto        | 8         |
| Aung et al.     | 2021 | Australia| GDS               | 254         | 42                                        | 49.4 (9.5)                         | 91.7             | .        | only alcohol/substance intoxication at time of assessment excluded | 2011-2012                          | primary care clinic in Sydney          | 8         |
| Awori et al.    | 2018 | Kenya   | MoCA (26)         | 215         | 69                                        | 44.5, 18-65                        | 100              | 47.2     | only CNS abnormalities excluded         | 2015-2016                          | Aga Khan University Hospital            | 8         |
| Bai et al.      | 2017 | Italy   | Frascati          | 155         | 32.3 (25.8, 6.5, 0)                      | 39 (31-46)                         | 0                | 92       | yes                                    | .                                 | .                                              | 8         |
| Banerjee, McIntosh & Ironson | 2019 | USA     | HDS (10)          | 209         | 14.8                                     | 37.7 (8.7)                         | 49.3             | 71.8     | yes                                    | 1997-2000                          | physician’s offices, specialty clinics, service organizations, and hospitals in Miami, Florida | 8         |
| Barber et al.   | 2017 | UK      | IHDS (10)         | 144         | 21.5                                     | 41 (37-45)                         | .                | 100      | yes                                    | .                                 | MSM Neurocoog Study                     | 6         |
| Authors                  | Year | Country | Type of Test | Mean (SD) | N | % | Notes                                                                 |
|-------------------------|------|---------|--------------|-----------|---|---|----------------------------------------------------------------------|
| Becker et al.           | 2004 | USA     | clinical NP ratings | 280 20.2 39.3 (8.2) | 17 | 83.9 | no | Allegheny County Neuropsychiatric Survey (ACNS)                        |
| Belete, Medfu & Yemiayrew | 2017 | Ethiopia | IHDS (9.5)     | 234 33.3 38.3 (9.9) | 88 | 35  yes | 2016 | Ayder Comprehensive Specialized Hospital                              |
| Bharti et al.           | 2021 | Nigeria | GDS           | 174 27.6 34.3 (7.6) | 0  39.7 unspecifed, 36% ASYMPTOMATIC MALARIA | 2011-2012 | neuroAIDS study in Abuja, Nigeria                                    |
| Bloch et al.            | 2016 | Australia | Frascati     | 264 30.7 (15, 12.6, 3.1) | 48.5 (15.1) | 91.7 | 99.6 no | 2011-2012 | Holdsworth House Medical Practice, Sydney                             |
| Boccellari et al.       | 1993 | USA     | Gislen (uncategorised) | 55 22 39.6 (5.5) | 12.7 | 100 yes | 1989 | San Francisco General Hospital                                       |
| Bornstein et al.        | 1993 | USA     | (1.5 SD in at least 6 out of 15 measures) | 233 12.8 34.4 (7.1) | . 100 | only neurological, head injuries & history of drug use excluded | . | AIDS Clinical Trials Unit and local HIV-related community-based support groups |
| Bourgeois et al.        | 2020 | USA     | MoCA (26)    | 359 33.7 57.4 (5.9) | 98  85 unspecifed | 2012-2014 | two San Francisco HIV clinics                                     |
| Braganca & Palha        | 2011 | Portugal | GDS           | 130 51 39.3 (6.1) | 100 | 63.1 yes | 2008 | Infectious Diseases Service (IDS) of Hospital of S. João             |
| Brito-Marques et al.    | 2020 | Brazil  | MoCA (23)    | 133 83.5 44.7 (8.8) | .  | 57.9 yes | 2016-2017 | Hospital Universitário Oswaldo Cruz (HUCC), Universidade de Pernambuco (UPE), Recife |
| Broutille et al.        | 2015 | USA     | Frascati (HAD) | 200 33 43 (11) | 100 | 72 yes | . | outpatient Infectious Disease Clinic at Washington University in St. Louis (WUSTL) |
| Broutille et al.        | 2021 | Canada  | GDS           | 263 52.5 54.4 (8.0) | .  | 84 yes | 2014-2017 | Positive Brain Health Now Canadian cohort                               |
| Bryant et al.           | 2015 | USA     | Frascati (uncategorised) | 120 58.1 45.2 (9.5) | 82.4 | 63.6 no | . | The Miriam Hospital Immunology Center                                  |
| Bunupuradah et al.      | 2012 | Thailand | Frascati (uncategorised) | 93 31.2 36.9 (32.8-40.5) | 100 | 60.2 only CNS infections excluded | 2008-2009 | HIV STAR study                                                        |
| Carvalhal et al.        | 2016 | Canada  | GDS           | 417 60 46.8 (9.7) | 100 | 81 no | . | Ontario HIV Treatment Cohort Study (OCS)                              |
| Casado et al.           | 2014 | Spain   | Frascati (uncategorised) | 229 13 44.6 (36-51) | 100 | 77 only psychiatric disorders & CNS infections excluded | 2011-2012 | . |
| Chaermchai et al.       | 2013 | Thailand | clinical NP ratings | 75 51 34 (7) | 0  44 yes | 2008-2012 | SEARCH 007 & 011, Bangkok                                              |
| Chan et al.             | 2012 | Singapore | Frascati     | 132 22.7 (15.9, 5.3, 1.5) | 45.9 (10.1) | . 86.4 only neurological & psychiatric disorders excluded | 2010 | Communicable Disease Centre of Singapore                             |
| Chan et al.             | 2021 | Thailand | Frascati (uncategorised) | 67 30 28 'median' | 0  96 unspecified | . | RV254 Thai AHI cohort                                                 |
| Chan et al.             | 2019 | China   | IHDS (10)    | 98 39 31 (26-43) | 0  94 only neurological & psychiatric disorders excluded | 2013-2015 | AIDS Clinical Service, Queen Elizabeth Hospital, Hong Kong           |
| Chang et al.            | 2011 | USA     | Frascati     | 69 42 (18.8, 21.7, 1.4) | 47.4 (1.2) | 80  91 yes | . | . |
| Ciccarelli et al.       | 2011 | Italy   | Frascati     | 146 47.2 (35.6, 11.6, 5) | 46.6 (20.4-54.8) | 88.4 58 yes | 2008-2010 | . |
| Ciccarelli et al.       | 2013 | Italy   | Frascati     | 101 49.5 (49.5, 0, 0) | 47 (42-52) | 100 66 yes | 2008-2010 | . |
| Year | Country | Study | Description | Sample Size | Age | Sex | Duration | Location | Notes |
|------|---------|-------|-------------|-------------|-----|-----|----------|----------|-------|
| 2019 | Italy   | Ciccarelli et al. | Gissén (uncategorised) | 366 | 12 | 46 (40-52) | 96.1 | 79.3 | yes, 19.4% HCV-CONFECTION | Agostino Gemelli University Hospital, Rome and S. Caterina Novella Hospital, Galatina |
| 2014 | India   | Cook et al. | Frascati (uncategorised) | 60 | 57 | 38.2 (8.4) | 100 | 70 | only psychiatric disorders & substance use excluded | PGIMER Immunodeficiency Clinic in Chandigarh, India |
| 2016 | India   | Cook et al. | IHDS (10) | 75 | 36 | 29 (6) | 0 | 62.7 | only CNS infections, head injuries & substance use excluded | Postgraduate Institute of Medical Education & Research, Chandigarh |
| 2013 | USA     | Cross et al. | IHDS (10) | 507 | 41 | 42 (33-49) | 75 | 65.1 | no | 2008 |
| 2013 | USA     | Crum-Cianflone et al. | GDS | 200 | 19 | 36.4 (28.1-43.6) | 70.5 | 95.5 | only acute medical events excluded | Reference and Treatment Center for STD/AIDS in the city of São Paulo |
| 2015 | Brazil  | Cruz & Ramos | MMSE (23) | 142 | 28.1 | 60-81 | 82.3 | 56.3 | unspecified | Anhui province, local hospital in Fuyang City |
| 2010 | China   | Cysique et al. | GDS | 192 | 42.7 | 40.2 (6.3) | 60.9 | 61 | unspecified | CARES cohort |
| 2017 | USA     | Dampier et al. | GDS | 112 | 59.3 | 51 (46-56) | 100 | 64.3 | only alcohol/substance intoxication at time of assessment excluded | Guangxi Zhuang autonomous region of Southern China |
| 2015 | China   | Dang et al. | IHDS | 230 | 37.5 | 18-65 | . | . | yes | 2011-2012 |
| 2021 | Switzerland | Darling et al. | Frascati | 981 | 39.8 (25.4, 0.8, 0.6) | 54.5 (7.5) | 97.8 | 79.7 | no | NAMACO study |
| 2019 | UK      | Davies et al. | MNC | 76 | 28 | 46.9 (12.4) | 100 | 100 | yes | 2013-2016 |
| 2016 | China   | Day et al. | GDS | 308 | 26.6 | 36 (32-40) | 37 | 65 | unspecified, 91% HCV CONFECTION | Anhui and Yunnan, China |
| 2017 | Brazil  | de Almeida et al. | Frascati | 60 | 60 (48.3, 3.3, 8.3) | 42.5 (9.1) | 78 | 50 | yes, BUT 20% with HCV CONFECTION | Hospital de Clinicas UFPR (HC-UFPR), Curitiba |
| 2002 | Italy   | de Ronchi, Faranca & Berardi | Frascati (HAD) | 182 | 20.3 | . | 98.9 | 79.1 | only neurological, psychiatric disorders & CNS infections excluded | University of Bologna |
| 2019 | USA     | Deiss et al. | GDS | 189 | 18.5 | 36 (28-44) | 65.6 | 100 | no | 2009-2011 |
| 2020 | USA     | Derry et al. | McCa (23) | 162 | 35 | 61.2 (5.8) | . | 67 | unspecified | Weill Cornell Clinical and Translational Science Center |
| 2017 | China   | Ding et al. | IHDS (10) | 345 | 46.7 | 52.7 (9.5) | 87 | 78 | unspecified | Taizhou Prefecture of Zhejiang Province |
| 2020 | Italy   | Donne et al. | Frascati | 85 | 7 (7, 0, 0) | 54 (48-60) | 78 | 78 | yes | Infectious Diseases Institute of Policlinico Gemelli Foundation of Rome |
| 2020 | Brazil  | Duarte et al. | IHDS (10) | 148 | 69.6 | 43'median' | . | 38.5 | unspecified | Hospital Nereu Ramos (HNR) |
| 2015 | France  | Dufouil et al. | Frascati | 400 | 58.5 (20.8, 31, 6.8) | 47.3 (10.2) | 95 | 79.2 | unspecified | Center for Aquitaine cohort |
| 2013 | USA     | Dufour et al. | GDS | 355 | 22.1 | 47.7 (10.5) | 82.2 | 74 | yes | 2007-2011 |
| 2014 | China   | Dwyer et al. | Frascati (uncategorised) | 50 | 69 | 35 (7.3) | 70 | 84 | unspecified | Ditan Hospital |
| Authors            | Year | Country  | Methodology | N | Age (Range) | Gender | Psychiatric Disorders & CNS Infections Excluded | Study Period | Location                                      | Notes |
|--------------------|------|----------|-------------|---|-------------|--------|-------------------------------------------------|--------------|-----------------------------------------------|-------|
| Elham et al.       | 2020 | Iran     | Frascati    | 93| 50.6 (23.7, 18.3, 8.6) | 36.6 (9) | 92.5 | yes | 2016-2017 | VCT center, Tehran | 8 |
| Ene et al.         | 2016 | Romania  | GDS         | 194| 36.5 | 24 (1.5) | 91.7 | 48.4 | 2014 | . | 8 |
| Erlanson et al.    | 2019 | USA      | Frascati (uncategorised) | 987| 17 | 51 'median' | . | 81 | unspecifieed | 2013-2014 | HAILO study | 6 |
| Estiasari et al.   | 2015 | Indonesia| Frascati (uncategorised) | 62| 51 | 31 (19-48) | 0 | 68 | only neurological, psychiatric disorders, head injuries & CNS infections excluded | 2013-2014 | Cipto Mangunkusumo Hospital, Jakarta | 7 |
| Fabbiani et al.    | 2018 | Italy    | Frascati    | 266| 16.2 (16.2, 0, 0) | 44 (36-50) | 100 | 79.7 | . | ATLAS-M trial | 7 |
| Fabbiani et al.    | 2017 | Italy    | Frascati (uncategorised) | 54| 13 | 50 'median', 27-60 | 100 | 85.2 | only CNS infections & substance use excluded | . | . | 6 |
| Fabbiani et al.    | 2019 | Italy    | T-Score (40) | 146| 24 | 50 (46-54) | 92.5 | 76 | yes, ALL COINFECTED WITH HCV | 2009-2018 | Rome, Monza and Siena | 7 |
| Falide-Garrido et al. | 2008 | Spain    | Frascati (HAD) | 88| 52.3 | 33.8 (5.2) | 83 | 64.8 | yes | . | hospitals in Ourense | 7 |
| Fazeli, Woods & Vance | 2019 | USA      | clinical NP ratings | 174| 53 | 51.3 (7) | 91 | 62 | . | University HIV/AIDS Clinic | 8 |
| Ferrando et al.    | 2003 | USA      | Frascati (uncategorised) | 141| 62 | 40 (8) | . | 100 | only history & current substance use excluded | 1995-1997 | . | 6 |
| Fialho et al.      | 2013 | Portugal | HDS (10)    | 103| 57.3 | 43.9 (12.4) | 100 | 0 | only neurological, psychiatric disorders & current substance use excluded | 2010 | Infectious Diseases Service (IDS) of the Portuguese National Health System Hospital (Lisbon) | 7 |
| Filho & de Melo    | 2012 | Brazil   | MMSE (24)   | 52| 36.5 | 57.6 (6.2) | 94.2 | 55.8 | only neurological & psychiatric disorders excluded | 2006 | Correia Picuço Hospital and the University Hospital of the Universidade Federal de Pernambuco (UPPE) | 7 |
| Fitri, Rambe & Fitri | 2018 | Indonesia| MoCA (26)   | 85| 75.3 | 38.5 (9.8) | . | 61.2 | only neurological, psychiatric disorders & CNS infections excluded | 2017 | Adam Malik General Hospital Medan North Sumatera Indonesia | 6 |
| Flatt et al.       | 2021 | Tanzania | Frascati    | 253| 47.1 (25.3, 18.2, 3.6) | 57 'median' | 95.5 | 27.7 | no | 2016 | Mawenzi Regional Referral Hospital (MMRH) HIV Care and Treatment Centre (CTC) | 8 |
| Foca et al.        | 2016 | Italy    | Frascati    | 206| 47.1 (30.6, 15.1, 5.0) | 40.2 (10.4) | . | 85 | only neurological, psychiatric disorders & CNS infections excluded | 2009-2013 | University Department of Infectious and Tropical Diseases of University of Brescia and Spedali Civili General Hospital (Brescia, Italy) | 8 |
| Foley et al.       | 2013 | USA      | GDS         | 79| 21.5 | 21-79 | . | 78.5 | only CNS infections & brain injuries excluded | . | local hospitals and community agencies in the Los Angeles area | 7 |
| Study           | Year | Country | Location | Sample Size | Mean | Standard Deviation | Median | Sample Type | Exclusion Criteria                                                                 | Hospital/Institution                                      |
|-----------------|------|---------|----------|-------------|------|--------------------|--------|-------------|-----------------------------------------------------------------------------------|----------------------------------------------------------|
| Ganasen et al.  | 2008 | South Africa | HDS (10) | 474        | 17.1 | 34.3 (7.9)         |        | unspecified | Venture healthcare HIV clinics, in the Western Cape of South Africa                |                                                          |
| Gandhi et al.   | 2011 | USA     | Frascati | 114        | 86   | 32.5, 19.3, 34.2   | 46.8   | (6.4)      | only neurological, psychiatric disorders & CNS infections excluded               | General Clinical Research Clinic at Johns Hopkins Hospital in Baltimore |
| Garvey, Surendrakumar & Winston | 2011 | UK     | Frascati (uncategorised) | 101 | 19 | 53 (43-62) | 100 | 88 | only neurological & substance use history excluded                                  |                                                          |
| Gascon et al.   | 2018 | Brazil  | Frascati | 412        | 73.6 | 50.9, 16.2, 6.3    | 45.3   | (10.7)     | yes                                                                                | Institute of Infectious Diseases Emilio Ribas (IER), Sao Paulo |
| Gibbie et al.   | 2006 | Australia | HDS (10) | 129        | 7    | 44.7               | 93     | 95         | unspecified                                                                        | Melbourne                                                |
| Gomez et al.    | 2019 | Canada  | Frascati | 381        | 21.2 | 8.1, 11, 2.1       | 47.3   | (11.1)     | only neurological, psychiatric disorders, CNS infections & head injuries excluded | Southern Alberta HIV Clinic (SAC) in Calgary, Alberta |
| Goodkin et al.  | 2014 | South Africa | Frascati (uncategorised) | 70 | 43 | 31.5 (8) | 0 | 18.6 | unspecified                                                                              |                                                          |
| Gott et al.     | 2017 | Australia | GDS      | 96         | 55.2 | 56.1 (7.9)         | 100    | 97.9       | only neurological, psychiatric disorders & substance use excluded                 | St Vincent's Hospital                                      |
| Grauer et al.   | 2015 | Germany | Frascati | 86         | 87.2 | (29.1, 43, 15.1)   | 49' median', 19-72 | 89 | 82.6 | unspecified                                                                        | University Hospital Muenster                               |
| Greene et al.   | 2015 | USA     | MoCA (26) | 155        | 46.5 | 57 (54-62)         | 100    | 93.6       | no                                                                                 | University of California San Francisco SCIOPE cohort       |
| Grima et al.    | 2012 | Italy   | Frascati | 116        | 46.6 | 46.6, 0, 0         | 44 (37-49) | 97.4 | 78.5 | yes                                                                                |                                                          |
| Groff et al.    | 2020 | USA     | Frascati | 77         | 37.7 | (28, 9, 2, 6)      | 47.5   | 100        | 59.7       | only neurological, psychiatric disorders & substance use excluded                 |                                                          |
| Grundt et al.   | 2013 | Australia, USA, Brazil, Thailand | Frascati (HAD) | 258 | 13.6 | 40 (35-45) | 96.1 | 57.8 | unspecified                                               | SMART study                                              |
| Gupta & Venugopal | 2020 | India   | Frascati (uncategorised) | 384 | 48 | 38.3 (9.2) | 100 | 62.5 | yes                                                                                   |                                                          |
| Gupta et al.    | 2007 | India   | Frascati (below 15th percentile in at least 2 domains) | 119 | 60.5 | 29.9 (5.6) | 0 | 43.7 | only neurological & CNS infections history excluded                                 | National Institute of Mental Health and Neuro Sciences (NMHANS), Bangalore |
| Haddow et al.   | 2018 | UK, Denmark, Belarus, Italy | Frascati | 448 | 25.8 (20, 4.9, 0.9) | 45.8 (9.6) | 89.1 | 84.4 | no                                                                                   | MULTICENTER study: CIPHER study                           |
| Halman et al.   | 2014 | Canada  | Frascati (uncategorised) | 83 | 48.2 | 49.2 (10.5) | 74.7 | 80.7 | no                                                                                   | Casey House                                               |
| Hanna et al.    | 2020 | USA     | Frascati | 108        | 37   | 21.3, 9.2, 6.5     | 26-72  | .  | 58 | yes                                                                                 |                                                          |
| Heaton et al.   | 2008 | China   | GDS      | 201        | 35.5 | 40.9 (6.4)         | 64     | 60.7       | yes                                                                                | Fuyang, Anhui                                              |
| Study                                      | Year | Country     | Methodology | N | Age (Range) | Test | Gender | Diagnosis | Other Information                                      | Location                        | Notes                                      |
|-------------------------------------------|------|-------------|-------------|---|-------------|------|--------|-----------|--------------------------------------------------------|---------------------------------|-------------------------------------------|
| Hestad et al.                             | 2019 | Zambia      | GDS         | 275| 36.7        | 41.1 (8.8) | 100    | 38.6      | only neurological, psychiatric disorders & substance use excluded | .                               | Lusaka 8                                  |
| Hirasuthikul et al.                       | 2019 | Thailand    | MoCA (25)   | 340| 59.4        | 55 (52-68) | .      | 61.5      | unspecified                                          | 2015-2017 HIV-NAT 006 long-term cohort | 6                                           |
| Holguín et al.                            | 2011 | Zambia      | IHDS (10)   | 54 | 22          | 34 (0.8)   | 0      | 35        | only brain injuries excluded                          | .                               | Lusaka 7                                  |
| Imai et al.                               | 2020 | Japan       | Frascati    | 444| 26.1 (16, 9.7, 0.4) | 45 (40-55) | .      | 95        | yes, BUT 13% with hemophilia                        | 2016-2018 AIDS Clinical Center in National Center for Global Health and Medicine (ACC) | 8                                           |
| Imam                                      | 2007 | Nigeria     | MMSE (25)   | 202| 12.3        | 35.7 (12-60) | 59.9  | 47.6      | no                                                   | 2003 State House Clinic in Abuja | 7                                           |
| Invernizzi et al.                         | 2018 | Italy       | MoCA (26)   | 69 | 49.2        | 53 (7.3)   | .      | 69.6      | no                                                   | 2015-2016 Luigi Sacco Hospital | 6                                           |
| Janssen et al.                            | 2015 | Netherlands | Frascati    | 95 | 41.1 (35.8, 5.3, 0) | 48.2 (10.1) | .      | 87.4      | yes                                                  | 2012-2014 Art-NeCo study | 7                                           |
| Janssen et al.                            | 1989 | USA         | Frascati (HAD) | 100 | 20 | 35.1 (4) | . | 100 | yes | 1979-1980 San Francisco City Clinic | Institute of Infectious and Tropical Diseases in Belgrade | 6                                           |
| Jevtovic et al.                           | 2009 | Serbia      | HDS         | 96 | 41.7        | 44 (12.1)  | 100    | 80.2      | unspecified                                          | .                               | Institute of Infectious and Tropical Diseases in Belgrade | 6 |
| Joska et al.                              | 2016 | South Africa, USA | Frascati | 156 | 74 (26.2, 29.4, 12.2) | 40 'median' | 100 | 37.2 | unspecified | . | Cape Town and Baltimore | 8 |
| Joska et al.                              | 2011 | South Africa | Frascati    | 170| 76.5 (8.8, 42.4, 25.3) | 29.5 (3.6) | 0 | 26 | only mental health problems, substance use & head injuries excluded | 2008-2009 three primary health care centers in Cape Town | 8 |
| Joska et al.                              | 2019 | South Africa | CSID        | 55 | 18.18       | .          | 86.1 | 29.1 | unspecified | . | Eastern Cape in South Africa | 6 |
| Jumare et al.                             | 2020 | Nigeria     | Frascati    | 190| 24.2 (16.8, 7.4, 0) | 33 (29-40) | 0 | 34.7 | yes | 2011-2014 Abuja, Nigeria | 7 |
| Jumare et al.                             | 2019 | China, India, Nigeria | GDS | 767 | 27.1 | 35 (9) | . | 58.2 | unspecified | . | . | 6 |
| Kabuba et al.                             | 2017 | Zambia      | GDS         | 266| 34.6        | 40.7 (8.7) | 100    | 40        | only neurological disorders & substance use excluded | .                               | Chilenje, Chipata, Kabwata, Kalingalinga, Matero Main, and Matero Referral Clinics | 8 |
| Kalayjian et al.                          | 2019 | USA         | GDS         | 225| 22.7        | .          | 100    | 90.9      | only neurological disorders excluded                  | .                               | AIDS Clinical Trials Group Study AS303 | 7 |
| Kalayjian et al.                          | 2014 | USA         | BNCS        | 1872| 24          | 40 (33-47) | 89 | 82       | unspecified                                          | .                               | ALLRT study | 7 |
| Kalianpur et al.                          | 2016 | USA         | GDS         | 1261| 36.2        | 43 (8.5)   | 70.3 | 77       | yes                                                  | 2003-2007 CHARTER study | 8 |
| Kalunweka et al.                          | 2014 | Zambia      | MMSE (22)   | 58 | 50          | 36.8 (24-47) | 36 | 53       | unspecified                                          | 2011-2013 University Teaching Hospital in Lusaka | 6 |
| Kamal et al.                              | 2017 | Switzerland | Frascati    | 59 | 27.1 (15.2, 6.8, 5.1) | 53 (47-58) | 100 | 66       | no, BUT subsequently excluded                       | .                               | Swiss HIV Cohort Study (SHCS) | 7 |
| Kamat et al.                              | 2017 | India       | GDS         | 69 | 33          | 37.4 (8.1) | 61 | 66.7     | unspecified                                          | 2010-2013 YRG CARE in Chennai | 7 |
| Kammenga et al.                           | 2017 | Australia   | GDS         | 55 | 47.2        | 49.3 (8.9) | 87 | 100      | only neurological, psychiatric disorders & current substance use excluded | 2011-2012 Sydney | 8 |
| Karlsen, Froland & Reindvag               | 1994 | Norway      | T-Score (40) | 52 | 26.9        | 36 (8.4)   | . | 88.5      | only drug use excluded                               | 1986-1990 National Hospital (Rikshospitalet) | 6 |
| Kelly et al.                              | 2014 | Malawi      | Frascati    | 106 | 70 (55, 12, 3) | 39 'median', 18-71 | 100 | 27 | only neurological disorders excluded | 2011-2012 Queen Elizabeth Central Hospital (QECH), Blantyre | 8 |
| Kemp et al.                               | 2021 | UK          | NMM         | 140| 40.7        | 52.2 (9.7) | 96 | 83       | only neurological disorders excluded                  | .                               | HIV-POGO study | 8 |
| Study                                      | Location     | Frascati/  | MMSE/     | GDS/   | Age     | Gender |
|-------------------------------------------|--------------|------------|-----------|--------|---------|--------|
| Kim et al.                                | South Korea | Frascati   | 194       | 26.3   | 45.1    | yes    | Seoul  |
| Kinal et al.                               | Japan        | Frascati   | 728       | 25.3   | 45.6    | yes    |        |
| Klusman et al.                             | USA          | Frascati (HAD) | 103     | 37.9   | 28.7    |        |        |
| Korten et al.                              | Turkey       | Frascati   | 162       | 45.7   | 43.5    |        | Istanbul|
| Ku et al.                                  | South Korea | Frascati   | 194       | 26.3   | 45.1    | yes    |        |
| Kumar et al.                               | India        | MMSE       | 200       | 21     |         | 65     | 65     |
| Kupprat et al.                             | USA          | MMSE       | 169       | 23.7   | 55.8    |        |        |
| Lawler et al.                              | Botswana     | Frascati (uncategorised) | 60    | 36.7   | 37.5    | yes    | 2009   |
| Lawler et al.                              | Botswana     | IHDS (9.5) | 120      | 38     | 37.5    | yes    | 2008   |
| Libertone et al.                           | Italy        | Frascati   | 556       | 31.7   | 57.7    |        |        |
| Lu et al.                                  | Australia    | Frascati   | 55        | 49.1   | 96.4    | yes    | 2011-2012|
| Madan, Singh & Golecha                     | India        | MMSE (20)  | 172       | 10.5   |         |        |        |
| Maj et al.                                 | Germany, Brazil, Zaire, Kenya, Thailand | (2 SD in at least 3 out of 10 measures) | 602     | 13     |         |        |        |
| Makinson et al.                            | France       | Frascati   | 200       | 35.5   | 62.7    |        | The ANRS EP58 HAND 55–70 Study |
| Marin-Webb et al.                          | Germany      | Frascati   | 480       | 43     | 43      | yes    |        |
| Matchanova et al.                          | USA          | GDS        | 142       | 59.6   | 57.1    |        | greater San Diego county |
| Mayeux et al.                              | USA          | Frascati (uncategorised) | 111    | 44.1   | 41.2    |        |        |
| McCutchan et al.                           | USA          | Frascati (uncategorised) | 266    | 27     | 40.0    | no     | 1999   |
| McNamara et al.                            | Ireland      | BNCS       | 604       | 51.5   | 40.9    | yes    | St. James’s Hospital, Dublin (SJH) |
| Metral et al.                              | Switzerland  | Frascati   | 981       | 26.8   | 54.5    |        |        |
| Millanini et al.                           | USA          | Frascati   | 74        | 52.7   | 67.0    | yes    |        |
| Millanini et al.                           | Kenya, Tanzania, Uganda, Nigeria | Frascati (uncategorised) | 2472   | 38     | 39.7    |        |        |
| Authors              | Year | Country      | Methodology | Sample Size | Age | Gender | Diagnosis Excluded | Study Details                                                                 | Reference |
|---------------------|------|--------------|-------------|-------------|-----|--------|--------------------|--------------------------------------------------------------------------------|-----------|
| Mogamby et al.      | 2017 | South Africa | IHDS (10)   | 146         | 53  | 35 (18-56) | 0                  | 45.9 only psychiatric disorders & CNS infections excluded 2014-2015 peri-urban HIV clinic in KwaZulu-Natal | 7         |
| Mohamed, Oduor & Kinyanjui | 2020 | Kenya        | MoCA       | 360         | 81.1| 40.2 (11.5) | 100                | 35 yes Moi Teaching and Referral Hospital (MTRH) 8                           | 8         |
| Molinaro et al.     | 2020 | Uganda       | IHDS (10)   | 399         | 59  | 35 (8)   | 0                  | 53 only neurological disorders excluded 2013-2015 Rakai Community Cohort Study | 8         |
| Moore et al.        | 2012 | USA          | GDS        | 200         | 19  | 36.4 (28.1-43.6) | 64                | 95.5 unspecified 7                                                      | 7         |
| Mugendi et al.      | 2019 | Kenya        | IHDS (10)   | 345         | 12.5| 42 (9.5) | 100                | 58.6 yes 2015 HIV clinic of the Kenyatta National Hospital in Nairobi 8     | 8         |
| Mukherjee et al.    | 2018 | Malaysia     | MoCA (26)  | 342         | 22.8| 44.7 (10.2) | 100                | 82.2 no 2014-2016 University of Malaya Medical Center (UMMC) in Kuala Lumpur 7 | 7         |
| Munoz-Moreno et al. | 2010 | Spain        | Frascati   | 83          | 42.2 (19.3, 16.9, 6) | 44 (37-51) | .                  | 73.5 yes 2006-2008 University of Malaya Medical Center (UMMC) in Kuala Lumpur | 7         |
| Munoz-Moreno et al. | 2013 | Spain        | Frascati   | 106         | 48 (33, 15, 0) | 44 (39-48) | 86                | 87 no 2008-2011 7 hospitals in Barcelona 7                               | 7         |
| Munoz-Moreno et al. | 2008 | Spain        | Frascati (uncategorised) | 64          | 60.9| .        | 73.4                | 70.3 yes 2008 HIV outpatient clinic of the hospital, which is located on the outskirts of Barcelona | 6         |
| Nakku, Kinyada & Hoskins | 2013 | Uganda       | IHDS (10)   | 618         | 64.4| 35      | 64.6               | 27.3 no . semi-urban district of Entebbe 7                                  | 7         |
| Namagga et al.      | 2019 | Uganda       | IHDS (10)   | 393         | 58.2| 37.9 (8.6) | 100                | 26.7 yes 2017 Mbarara and Kunguriri districts in rural Southwestern Uganda 8 | 8         |
| Naveed et al.       | 2021 | USA          | T-Score (40)| 877         | 39.1| 47.1 (10.7) | 81.1                | 80.5 no 2000-2017 Adolescent Medicine Trials Network for HIV/AIDS Interventions & International Maternal Pediatric AIDS Clinical Trials sites 8 | 7         |
| Nichols et al.      | 2013 | USA          | GDS        | 215         | 64.7| 20.9 (1.8) | 0                  | 80.4 yes . Adolescent Medicine Trials Network for HIV/AIDS Interventions & International Maternal Pediatric AIDS Clinical Trials sites 8 | 8         |
| Njamshi et al.      | 2008 | Cameroon     | IHDS (10)   | 204         | 21.1| 37.2 (8.8) | .                  | 31.4 yes 2006 The Day Care Hospital 7                                      | 7         |
| Nyamayaro et al.    | 2020 | Zimbabwe     | GDS        | 155         | 49.7| 37.8 (11.2) | 100                | 30 only neurological, psychiatric disorders & alcohol use excluded 2018 .    | 8         |
| Odase, Ogurin & Ogwumyi | 2006 | Nigeria     | CSID       | 192         | 65.6| 32.5 (7)   | 0                  | 50 yes 2004 University Teaching Hospital, Benin City 8 .                   | 8         |
| Oshinaikhe et al.   | 2012 | Nigeria     | MMSE (26)  | 208         | 2.9 | 36.8 (8.3) | 100                | 34.1 yes 2007-2008 Lagos University Teaching Hospital (LUTH) 8              | 8         |
| Overton et al.      | 2013 | USA         | MoCA       | 200         | 51  | 43.3 (10.7) | 100                | 72 yes . Washington University in St. Louis 6 ART clinic of Queen Elizabeth Central Hospital in Blantyre 8 | 8         |
| Patel et al.        | 2010 | Malawi      | IHDS (10)   | 179         | 14  | 18-85    | 74.9               | 35.2 only CNS infections & alcohol use excluded 2007 ART clinic of Queen Elizabeth Central Hospital in Blantyre 8 | 8         |
| Pereda et al.       | 2000 | Spain       | Frascati (HAD) | 100        | 27  | 33.6 (6.2) | 51                 | 71 only substance use excluded 1996-1997 ART clinic of Queen Elizabeth Central Hospital in Blantyre 8 | 7         |
| Perez-Valero et al. | 2013 | Spain       | Frascati   | 191         | 27.2 (19.9, 7.3, 0) | 45 (41-46) | 100                | 73.3 yes 2011-2012 ART clinic of Queen Elizabeth Central Hospital in Blantyre 8 | 7         |
| Pinheiro et al.     | 2016 | Brazil      | IHDS (10)   | 392         | 54.1| 42.8 (11.6) | 89.3               | 44.7 yes 2015 Servicio de Asistencia Especializada (SAE), Pelotas 8            | 8         |
| Study          | Year  | Region     | Method | Age (range) | Sample size | Diagnosis                          | Exclusion Criteria                                                                 | Duration |Notes                                                                 |
|---------------|-------|------------|--------|-------------|-------------|------------------------------------|------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------|
| Portilla et al. | 2019  | Spain      | Frascati | 29.8 (19, 8.3, 2.4) | 46 (7.5)  | yes                                | 2014-2015 Infectious Diseases Unit of the General University Hospital of Alicante | 8        |
| Pumpradit et al. | 2010  | Thailand   | Frascati | 37.5 (21.9, 14.1, 1.6) | 41 (36-46) | 100 59.4 | only CNS infections & head injuries excluded | .        | .                      |
| Qiao et al.    | 2019  | China      | MMSE    | 12.4        | 47.7 (11.2) | 92.8 66.7 | no                                  | 2017 Comparative HIV and Aging Research in Taizhou (CHART)                       | 7        |
| Robbins et al. | 2011  | South Africa | IHDS (10) | 65 80       | 38.5 (9.3) | 100 35.4 | only psychiatric disorders excluded | .        | general medical clinic in the Western Cape Region of South Africa       | 6        |
| Robertson et al. | 2019  | Brazil, India, Malawi, Peru, South Africa, Zimbabwe | Frascati (uncategorised) | 860 45   | 34 'median' 0 47.7 | only psychiatric disorders excluded | .        | AIDS Clinical Trials Group (ACTG) 5175, not ALLRT according to Smurzynski et al. (2008) | 8        |
| Robertson et al. | 2014  | Canada     | BNCS    | 2663 41.5 | 43 (19-83) | 68.8 61.7 | only opportunistic infections & substance use excluded | 2010-2011 MULTICENTER study: CRANIUM study | 8        |
| Rodrigues et al. | 2013  | Brazil     | Frascati (uncategorised) | 167 52.4 | 44 'median' 61.5 53.5 | yes | . | . | 7 |
| Ruhanya et al. | 2020  | South Africa | GDS    | 147 36.7 | 31.5 (5.2) | 17.8 16.6 | unspecified | . | primary care HIV-1 clinics in Cape Town | 7        |
| Sacktor et al. | 2016  | USA        | Frascati | 364 33 (14, 14, 5) | 47.4 (8.9) | 74.7 100 | yes | 2007 Multicenter AIDS Cohort Study | 8        |
| Sacktor et al. | 2014  | Uganda     | Frascati | 117 92 (19, 32, 41) | 36.7 (5.3) | 0 33.3 | yes | 2009-2010 Infectious Disease Clinic in Kampala | 8        |
| Saini & Barar | 2016  | India      | IHDS    | 80 32.5 | 21-50 | 100 56.3 | only psychiatric disorders & substance use excluded | 2011-2012 ART Centre of PBM and AG Hospital, Bikaner, Rajasthan | 7        |
| Salauhuddin et al. | 2020  | Ethiopia   | IHDS (10) | 244 39.3 | . | . 36 | only neuropsychiatric medications excluded | 2018 Muzan-Tepi University Teaching Hospital (MTUTH), Aman | 7        |
| Salawu et al.  | 2008  | Nigeria    | Frascati (uncategorised) | 60 56.7 | 32 (7.6) | 0 40 | only psychiatric disorders, head injuries & history of substance use excluded | . | . | 6 |
| Sanmarti et al. | 2020  | Tanzania   | Frascati (uncategorised) | 243 19.3 | 44.3 (36-52) | 100 29 | yes | . | Chronic Diseases Clinic of ifakara (CDC) | 8        |
| Sereia et al.  | 2012  | Brazil     | MMSE    | 100 27 | 20-64 | 100 62 | no | . | Parana | 7 |
| Sevigny et al. | 2007  | USA        | Frascati (uncategorised) | 329 68.5 | 41.9 (7.2) | 76.8 68.6 | only neurologic disorders, psychiatric disorders & CNS infections excluded | 1998-2002 Northeast AIDS Dementia Study cohort | 8        |
| Sheppard et al. | 2015  | USA        | Frascati (uncategorised) | 75 16 | 56.4 (5.9) | 100 84 | yes | . | greater San Diego community and local, urban HIV clinics | 7        |
| Simioni et al. | 2010  | Switzerland | Frascati | 200 84 (24, 52, 8) | 46 (30-69.6) | 72 | only CNS infections & substance use excluded | . | Lausanne and Geneva University hospitals | 7        |
| Spector et al. | 2010  | China      | GDS     | 201 36.8 | 40.2 (6.4) | 56.7 60.7 | yes, BUT 93% HCV COINFECTION | . | Anhui | 8        |
| Study                | Year | Country    | Methodology (uncategorised) | Sample Size | Mean Age (SD) | Follow-up | Study Details                                                                 |
|----------------------|------|------------|-----------------------------|-------------|---------------|-----------|-------------------------------------------------------------------------------|
| Starace et al.       | 2002 | Italy      | Gisslen                      | 395         | 17.9          | 100       | 67.8 only psychiatric disorders excluded                                      | 1999-2000 | NeuroICONA study                                                                 | 8        |
| Stern et al.         | 1991 | USA        | Frascati (uncategorised)     | 124         | 58.1          | 100       | unspecified                                                                   |          | AdeHIV Cohort Study                                                            | 6        |
| Su et al.            | 2018 | Netherlands| MNC                          | 103         | 17            | 100       | 100 yes                                                                       | 2011-2013| Paris University Hospital                                                     | 7        |
| Suarez et al.        | 2001 | France     | MMSE                         | 91          | 58.2          | 100       | 67.9 only psychiatric disorders excluded                                       | 1995-1999| UCSD HRP (HIV Neurobehavioral Research Program)                               | 7        |
| Sundermann et al.    | 2018 | USA        | GDS                          | 1361        | 42.7          | 85        | yes                                                                          |          | UCSD HRP (HIV Neurobehavioral Research Program)                               | 8        |
| Tamargo et al.       | 2021 | USA        | MMSE (24)                    | 394         | 14.7          | 53.6      | no                                                                            | 2016-2020| MASH cohort                                                                    | 6        |
| Temereanca et al.    | 2020 | Romania    | GDS                          | 214         | 35            | 48        | unspecified                                                                   | 2012-2014|                                                                                  | 7        |
| Thiyagarajan et al.  | 2010 | UK         | Frascati (uncategorised)     | 72          | 18            | 97        | 83.3 only neurological & substance use excluded, 37.5% HCV infection          |          | St Mary's Hospital, London                                                    | 7        |
| Tilghman et al.      | 2014 | India      | GDS                          | 155         | 36.1          | 97        | 57.1 yes                                                                      |          | National AIDS Research Institute (NARI) in Pune                                | 8        |
| Tomita et al.        | 2019 | South Africa| IHDS (10)                    | 151         | 43.5          | 21-59     | 100 15.2 only substance use excluded, 100% MDR-TB                            | 2015-2016| TB-specialist hospital in KwaZulu-Natal (KZN) Province                         | 8        |
| Tozzi et al.         | 2005 | Italy      | Frascati (uncategorised)     | 412         | 54.4          | 59.7      | 71.1 yes                                                                      | 1996-2004| Infectious Diseases Lazzaro Spallanzani, Rome                                  | 8        |
| Tremont-Lukas, Teixeira & Hernandez | 1999 | Venezuela  | MMSE (24)                    | 75          | 36            | 34, 18-57 | 92 only neurological & substance use history excluded                         | Hospital Vargas de Caracas, Venezuela          | 7        |
| Troncoso & de Oliveira Contero | 2015 | Brazil     | IHDS (10)                    | 111         | 52.2          | 46.7      | 87.7 56.6 only opportunistic infections excluded                             | 2013     | Infectious Diseases of the Faculdade de Medicina de Marilia (FAMEMA), Marilia City, State of Sao Paulo | 7        |
| Truffo et al.        | 2018 | Italy       | Frascati                     | 650         | 21.6 (15.7, 4.9, 1) | 50 (42-68) | 89.1 76.3 yes                                                                 | 2010-2017| Amedeo di Savoia Hospital, Turin                                              | 8        |
| Tsegaw et al.        | 2017 | Ethiopia    | IHDS (9.5)                   | 593         | 36.4          | 38.6      | 100 47.9 only psychiatric disorders excluded                                |          | Deesse Referral Hos-pital (DRH) and Kombolcha Health Center (KHC) HIV care Clinic | 8        |
| Underwood et al.     | 2019 | UK          | NMM                          | 639         | 21.4          | 57 (53-62) | 98.8 88.6 no                                                                  | POPPY study (COBRA and CHARTER excluded since separate larger cohort analysis available) | 8        |
| Valcour et al.       | 2013 | Thailand    | Frascati                     | 61          | 45.9 (22.9, 13.1, 9.9) | 34.7 (6.9) | 0 43 yes                                                                      | 2009-2011|                                                                                  | 7        |
| Valcour et al.       | 2004 | USA         | adapted MSK staging          | 202         | 19.7          | 45.6      | 72.7 82.8 only neurological & psychiatric disorders excluded                 | 2001     | Hawaii Aging with HIV Cohort Study                                            | 8        |
| van den Dries et al. | 2017 | Netherlands| GDS                          | 69          | 40.6          | 53 (11)   | 82.6 only neurological disorders excluded                                     | 2012-2013| The Dutch TREVI Cohort Study                                                  | 7        |
| van Gorp et al.      | 1999 | USA         | Frascati (HAD)               | 130         | 16.2          | 41 (8)    | 100 unspecified                                                               | 1995     |                                                                                  | 6        |
| Vassallo et al.      | 2015 | France      | Frascati                     | 204         | 29.9 (20.1, 7,8, 2) | 51.9 (10.1) | 77.5 only neurological disorders & opportunistic infections excluded        | 2007-2013| Neuradapt & Eldadapt studies                                                   | 8        |
| Vergori et al.       | 2019 | Italy       | Frascati                     | 542         | 22.7 (16.2, 5.7, 0.7) | 49 (42-56) | 96.7 81 yes                                                                   | 2011-2016|                                                                                  | 8        |
| Study            | Year | Country | Measure | N   | Mean | SD (Range) | Age Mean | Gender | Exclusion Criteria                                      | Study Dates          | Setting                                |
|------------------|------|---------|---------|-----|------|------------|----------|--------|--------------------------------------------------------|----------------------|--------------------------|
| Villa et al.     | 1996 | Italy   | 2 SD in at least 5 out of 24 measures | 78  | 28.2 | 32.3 (6.9) | 64.1     | .      | yes                                                   | .                    | .                         |
| Vitiello et al.  | 2007 | USA     | GDS     | 179 | 19   | 39.6 (7.5) | 67       | 96.1   | only psychiatric disorders & substance use excluded  | 1991-1994            | Multicenter AIDS Cohort Study     |
| Wang et al.      | 2019 | USA     | MNC     | 1531| 7.45 | 38.6 (8.4) | .        | 100    | no                                                    | .                    | Multicenter AIDS Cohort Study     |
| Wang et al.      | 2013 | China   | MoCA    | 309 | 48.2 | 34 (28-43.5) | 76.4     | 88     | only neurological disorders & substance use excluded | 2012-2013           | Shanghai Public Health Clinical Center |
| Widyadharma et al.| 2017 | Indonesia | MMSE (25) (below defined cut-offs in at least 2 out of 10 measures) | 96  | 33.3 | 15-49 | 77.1     | 68.8   | yes                                                   | 2008-2009            | Edelweiss Clinic Dr. Sardjito Hospital |
| Wilkins et al.   | 1991 | USA     | (uncategorised) | 77  | 36.4 | 33.5 (8.3) | .        | 92.2   | yes                                                   | .                    | .                         |
| Winston et al.   | 2013 | UK      | Frascati (uncategorised) | 557 | 51.2 | 44 (9) | 100     | 77     | no                                                    | .                    | PIVOT study               |
| Wojna et al.     | 2007 | Puerto Rico | Frascati | 60  | 68.4 (30, 11.7, 26.7) | 36.4 (7) | 80     | 0     | only neurological disorders excluded                  | .                    | NeuroAIDS Specialized Neuroscience Research Program (SNRP) |
| Wright et al.    | 2015 | Australia, Thailand, Brazil, Argentina, Chile, USA, UK, Belgium, Italy, Switzerland & Germany | Frascati (uncategorised) | 608 | 19.9 | 34 'median' | 0       | 89     | no                                                    | .                    | MULTICENTER START study      |
| Wright et al.    | 2008 | Thailand, China, Indonesia, Malaysia, Cambodia, Papua New Guinea, Fiji | Frascati (HAD) | 647 | 11.7 | 35.9 (9.5) | 65       | 59.2   | no                                                    | 2005-2006            | MULTISITE Asia Pacific NeuroAIDS Consortium (APNAC) |
| Wubetu, Asefa & Gebregiorgis | 2021 | Ethiopia | MMSE (25) | 422 | 41   | 20-64 | 100     | 39.6   | no                                                    | 2019-2020            | public hospitals of North Shoa Zone |
| Xiao et al.      | 2020 | China   | MoCA (26) | 250 | 87.2 | 65.7 (5.73) | 100     | 70.8   | only psychiatric disorders, sensory impairments & head injuries excluded | 2017                | Hunan province's main HIV clinics |
| Yakasai et al.   | 2015 | Nigeria | Frascati | 80  | 76.3 (41.3, 23.8, 11.3) | 36.8 (8.9) | 50     | 55     | yes                                                   | .                    | Aminu Kano Teaching Hospital (AKTH) in Northwestern Nigeria |

* (SD in at least 5 out of 24 measures)
| Study            | Year | Country | Method | Age (SD) | BMI (SD) | Evaluation | Follow-up | Study Location                                                                 |
|------------------|------|---------|--------|----------|----------|------------|-----------|--------------------------------------------------------------------------------|
| Yeohor et al.    | 2016 | Uganda  | GDS    | 181      | 38       | 36 (27-41) | 80.1      | 42 only neurological & psychiatric disorders excluded                          |
| Yideg et al.     | 2019 | Ethiopia| IHDS   | 328      | 35.7     | 38.2 (10.5) | 100       | 41.8 yes                                                                        |
| Yusuf et al.     | 2017 | Nigeria | Frascati| 418      | 21.5 (9.6, 9.1, 2.9) | 37.2 (9.3) | 100       | 22.3 no                                                                         |
| Zaegel-Faucher et al. | 2020 | France  | Frascati| 121      | 57 (28.9, 24.8, 3.3) | 53.1 (median) | .    | 68 yes 2011-2018 only conditions that may be mistaken as physical frailty excluded |
| Zamudio-Rodriguez et al. | 2018 | Mexico  | Frascati| 206      | 66 (60.2, 56.0) | 60.5 (6.3) | 100       | 84.9 ambulatory care at the HIV clinic of a university-affiliated tertiary care center in Mexico City |
| Zhang et al.     | 2012 | China   | Frascati| 134      | 37.3 (22.4, 10.4, 4.5) | 38.8 (9.5) | 73.1      | 56.7 yes                                                                         |
| Zhao et al.      | 2015 | China   | Frascati| 230      | 37.4 (18.3, 10.9, 8.3) | 49.2 (10.2) | 97.8      | 66.1 yes                                                                         |

8 - Most studies were conducted in Africa and Latin America.
Supplementary Table 2: Raw data summary. The table summarizes the characteristics of the 225 eligible studies for meta-analysis. Table made using PowerPoint.

|                      | North America | Latin America & Caribbean | Europe & Central Asia | East Asia & Pacific | South Asia | Sub-Saharan Africa | Middle East & North Africa |
|----------------------|---------------|---------------------------|-----------------------|---------------------|------------|-------------------|---------------------------|
| no. of studies       | 54            | 13                        | 58                    | 35                  | 10         | 48                | 1                         |
| publishing years     | 1989 – 2021   | 1999 – 2020               | 1994 – 2021           | 2006 – 2021         | 1997 – 2020| 2006 – 2021       | 2020                      |
| (range)              |               |                           |                       |                     |            |                   |                           |
| countries            | USA (48), Canada (6) | Puerto Rico (1), Venezuela (1), Mexico (1), Brazil (10) | Switzerland (4), Netherlands (3), France (5), Italy (19), Germany (2), UK (10), Spain (8), Belarus (1), Denmark (1), Portugal (2), Romania (2), Ireland (1), Norway (1), Serbia (1), Turkey (1) | Indonesia (4), South Korea (2), Singapore (1), Japan (2), Malaysia (2), Thailand (7), Australia (8), South Korea (2), China (14) | India (10) | Tanzania (3), South Africa (8), Malawi (2), Kenya (4), Nigeria (10), Botswana (2), Uganda (7), Cameroon (2), Ethiopia (7), Ghana (1), Zimbabwe (1), Zambia (4) | Iran (1) |
| (no. of studies)     |               |                           |                       |                     |            |                   |                           |
| net sample size      | 20,074        | 2,078                     | 13,894                | 7,704               | 1,494      | 13,662            | 93                        |
| assessment type      |               |                           |                       |                     |            |                   |                           |
| diagnostic           | 18%           | 62%                       | 2%                    | 31%                 | 10%        | 10%               | 10%                       |
| screening            | 6%            | 38%                       | 8%                    | 69%                 | 50%        | 40%               | 40%                       |
| other                | 76%           | 6%                        | 88%                   | 39%                 | 60%        | 39%               | 50%                       |
| exclusion criteria   |               |                           |                       |                     |            |                   |                           |
| yes                  | 17%           | 15%                       | 10%                   | 17%                 | 12%        | 17%               | 17%                       |
| partial              | 20%           | 31%                       | 45%                   | 32%                 | 30%        | 30%               | 30%                       |
| no                   | 26%           | 46%                       | 35%                   | 37%                 | 40%        | 40%               | 40%                       |
| unspecified          | 35%           | 31%                       | 10%                   | 30%                 | 12%        | 31%               | 17%                       |
| income level         |               |                           |                       |                     |            |                   |                           |
| high income          | 100%          | 100%                      | 100%                  | 100%                | 100%       | 100%              | 100%                      |
| upper middle income  | 8%            | 8%                        | 8%                    | 8%                  | 8%         | 8%                | 8%                        |
| lower middle income  | 8%            | 8%                        | 8%                    | 8%                  | 8%         | 8%                | 8%                        |
| low income           | 91%           | 91%                       | 91%                   | 91%                 | 91%        | 91%               | 91%                       |
| mixed / unclassified | 2%            | 2%                        | 2%                    | 2%                  | 2%         | 2%                | 2%                        |
| age range            | 16 – 83 *not reported in 2 studies | 18 – 81 *not reported in 4 studies | 18 – 83 *not reported in 1 study | 18 – 74 *not reported in 1 study | 18 – 75 *not reported in 2 studies | 18 – 64 *not reported in 4 studies |                           |
| ART coverage         | 76.2% *not reported in 17 studies | 85.8% *not reported in 2 studies | 92.8% *not reported in 11 studies | 78.1% *not reported in 6 studies | 59.4% *not reported in 2 studies | 75.3% *not reported in 4 studies | 92.5%                      |
| male gender          | 80.7%         | 57.7%                     | 78.2%                 | 73.9%               | 62.4%      | 37.4%             | 60.2%                     |
Supplementary Figure 1: Forest plot of study subgroups by geographical region (country). The subgroup “multiple regions” refers to multi-site studies. Figure made using STATA.

| Country Region                | Effect Size with 95% CI | Weight (%) |
|------------------------------|-------------------------|------------|
| East Asia & Pacific          | 0.39 [0.33, 0.44]       | 15.45      |
| Europe & Central Asia        | 0.37 [0.32, 0.41]       | 25.75      |
| Latin America & Caribbean   | 0.55 [0.45, 0.65]       | 5.69       |
| Middle East & North Africa   | 0.51 [0.40, 0.61]       | 0.43       |
| North America                | 0.37 [0.32, 0.41]       | 24.15      |
| South Asia                   | 0.39 [0.28, 0.49]       | 4.39       |
| Sub-Saharan Africa           | 0.44 [0.38, 0.51]       | 21.38      |
| multiple regions             | 0.32 [0.13, 0.51]       | 2.75       |
| **Overall (225 studies)**    |                         | 0.40 [0.37, 0.42] |

Heterogeneity: $\tau^2 = 0.04$, $I^2 = 98.16\%$, $H^2 = 54.26$

Test of $H_0: \tau = 0$; $Q(224) = 1383.319$, $p = 0.00$

Test of group differences: $Q_e(7) = 19.43$, $p = 0.01$

Random-effects REML model

Supplementary Figure 2: Forest plot including studies from East Asia & Pacific.

| Study                        | Effect Size with 95% CI | Weight (%) |
|------------------------------|-------------------------|------------|
| Aung et al. (2021)           | 0.42 [0.36, 0.48]       | 2.93       |
| Bloch et al. (2016)          | 0.31 [0.25, 0.36]       | 2.94       |
| Bunupuradah et al. (2012)    | 0.31 [0.22, 0.41]       | 2.80       |
| Chalermchaisri et al. (2013) | 0.51 [0.40, 0.62]       | 2.71       |
| Chan et al. (2012)           | 0.39 [0.29, 0.49]       | 2.79       |
| Chan et al. (2019)           | 0.23 [0.16, 0.30]       | 2.89       |
| Chan et al. (2021)           | 0.30 [0.19, 0.41]       | 2.73       |
| Cysique et al. (2010)        | 0.43 [0.36, 0.50]       | 2.89       |
| Dang et al. (2015)           | 0.38 [0.31, 0.44]       | 2.92       |
| Day et al. (2016)            | 0.27 [0.22, 0.32]       | 2.96       |
| Ding et al. (2017)           | 0.47 [0.41, 0.52]       | 2.95       |
| Dwyer et al. (2014)          | 0.69 [0.56, 0.82]       | 2.64       |
| Estiasari et al. (2015)      | 0.51 [0.40, 0.62]       | 2.73       |
| Fitri, Rambe & Fitri (2018)  | 0.75 [0.66, 0.84]       | 2.81       |
| Gibbie et al. (2006)         | 0.07 [0.03, 0.11]       | 2.97       |
| Gott et al. (2017)           | 0.55 [0.45, 0.65]       | 2.77       |
| Heaton et al. (2008)         | 0.35 [0.29, 0.42]       | 2.91       |
| Hiransuthikul et al. (2019)  | 0.59 [0.54, 0.65]       | 2.95       |
| Imai et al. (2020)           | 0.26 [0.22, 0.30]       | 2.98       |
| Kamminga et al. (2017)       | 0.47 [0.34, 0.60]       | 2.61       |
| Kim et al. (2016)            | 0.26 [0.20, 0.32]       | 2.92       |
| Kinai et al. (2017)          | 0.25 [0.22, 0.28]       | 3.00       |
| Ku et al. (2014)             | 0.26 [0.20, 0.32]       | 2.92       |
Supplementary Figure 3: Forest plot including studies from Europe & Central Asia.

Study | Effect Size with 95% CI | Weight (%)
--- | --- | ---
Alford et al. (2019) | 0.31 [0.18, 0.44] | 1.59
Arenas-Pinto et al. (2014) | 0.52 [0.48, 0.56] | 1.79
Bai et al. (2017) | 0.32 [0.25, 0.40] | 1.73
Barber et al. (2017) | 0.22 [0.15, 0.28] | 1.75
Braganca & Palha (2011) | 0.51 [0.42, 0.60] | 1.70
Casado et al. (2014) | 0.13 [0.09, 0.17] | 1.79
Ciccarelli et al. (2011) | 0.12 [0.09, 0.15] | 1.80
Ciccarelli et al. (2013) | 0.50 [0.40, 0.59] | 1.67
Ciccarelli et al. (2019) | 0.47 [0.39, 0.55] | 1.71
Darling et al. (2021) | 0.40 [0.37, 0.43] | 1.80
Davies et al. (2019) | 0.28 [0.18, 0.38] | 1.66
de Ronchi, Faranca & Berardi (2002) | 0.20 [0.14, 0.26] | 1.76
Donne et al. (2020) | 0.07 [0.02, 0.12] | 1.77
Dufouil et al. (2015) | 0.58 [0.54, 0.63] | 1.78
Ene et al. (2016) | 0.37 [0.30, 0.43] | 1.74
Fabbiani et al. (2017) | 0.13 [0.04, 0.22] | 1.69
Fabbiani et al. (2018) | 0.24 [0.17, 0.31] | 1.74
Fabbiani et al. (2019) | 0.16 [0.12, 0.21] | 1.79
Failde-Garrido et al. (2008) | 0.52 [0.42, 0.63] | 1.65
Fialho et al. (2013) | 0.57 [0.48, 0.67] | 1.68
Foca et al. (2016) | 0.47 [0.40, 0.54] | 1.74
Garvey, Surendrakumar & Winston (2011) | 0.19 [0.11, 0.27] | 1.72
Grauer et al. (2015) | 0.87 [0.80, 0.94] | 1.74
Grima et al. (2012) 0.47 [0.38, 0.56] 1.69
Haddow et al. (2018) 0.26 [0.22, 0.30] 1.79
Invernizzi et al. (2018) 0.49 [0.37, 0.61] 1.61
Janssen et al. (1989) 0.41 [0.31, 0.51] 1.67
Jevtovic et al. (2009) 0.42 [0.32, 0.52] 1.67
Kamal et al. (2017) 0.27 [0.16, 0.38] 1.62
Karlsen, Froland & Reinvang (1994) 0.19 [0.08, 0.30] 1.64
Kemp et al. (2021) 0.41 [0.33, 0.49] 1.71
Korten et al. (2021) 0.46 [0.38, 0.53] 1.72
Libertone et al. (2014) 0.32 [0.28, 0.36] 1.79
Makinison et al. (2020) 0.35 [0.29, 0.42] 1.75
Marin-Webb et al. (2016) 0.43 [0.39, 0.47] 1.79
McNamara et al. (2017) 0.51 [0.48, 0.55] 1.79
Metral et al. (2020) 0.27 [0.24, 0.30] 1.81
Munoz-Moreno et al. (2008) 0.48 [0.38, 0.58] 1.68
Munoz-Moreno et al. (2010) 0.42 [0.32, 0.53] 1.65
Munoz-Moreno et al. (2013) 0.61 [0.49, 0.73] 1.60
Pereda et al. (2000) 0.27 [0.18, 0.36] 1.70
Perez-Valero et al. (2013) 0.27 [0.21, 0.34] 1.75
Portilla et al. (2019) 0.30 [0.20, 0.40] 1.67
Simioni et al. (2010) 0.84 [0.79, 0.89] 1.78
Starace et al. (2002) 0.18 [0.14, 0.22] 1.79
Su et al. (2016) 0.17 [0.10, 0.24] 1.73
Suarez et al. (2001) 0.58 [0.48, 0.68] 1.66
Temereanca et al. (2020) 0.35 [0.29, 0.41] 1.75
Thiyagarajan et al. (2010) 0.18 [0.09, 0.27] 1.69
Tozzi et al. (2005) 0.54 [0.50, 0.59] 1.78
Trunfio et al. (2018) 0.22 [0.18, 0.25] 1.80
Underwood et al. (2019) 0.21 [0.18, 0.25] 1.80
van den Dries et al. (2017) 0.41 [0.29, 0.52] 1.62
Vassallo et al. (2015) 0.30 [0.24, 0.36] 1.75
Vergori et al. (2019) 0.23 [0.19, 0.26] 1.80
Villa et al. (1996) 0.28 [0.18, 0.38] 1.66
Winston et al. (2013) 0.51 [0.47, 0.55] 1.79
Zaegel-Faucher et al. (2020) 0.57 [0.48, 0.66] 1.70

Overall
Heterogeneity: $\tau^2 = 0.03$, I$^2 = 97.14\%$, $H^2 = 34.93$
Test of $\theta = \theta_0$: $Q(57) = 2014.87$, $p = 0.00$
Test of $\theta = 0$: $z = 16.30$, $p = 0.00$

Random-effects REML model
Supplementary Figure 4: Forest plot including studies from Latin America & Caribbean.

| Study                                | Effect Size with 95% CI | Weight (%) |
|--------------------------------------|-------------------------|------------|
| Brito-Marques et al. (2020)          | 0.83 [0.77, 0.90]       | 7.93       |
| Cruz & Ramos (2015)                  | 0.28 [0.21, 0.35]       | 7.63       |
| de Almeida et al. (2017)             | 0.60 [0.48, 0.72]       | 7.26       |
| Duarte et al. (2020)                 | 0.70 [0.62, 0.77]       | 7.83       |
| Filho & de Melo (2012)               | 0.37 [0.23, 0.50]       | 7.16       |
| Gascon et al. (2018)                 | 0.74 [0.69, 0.78]       | 8.07       |
| Pinheiro et al. (2016)               | 0.54 [0.49, 0.59]       | 8.03       |
| Rodrigues et al. (2013)              | 0.52 [0.45, 0.60]       | 7.85       |
| Sereia et al. (2012)                 | 0.27 [0.18, 0.36]       | 7.70       |
| Tremont-Lukats, Teixeira & Hernandez (1999) | 0.36 [0.25, 0.47] | 7.45       |
| Troncoso & de Oliveira Contero (2015) | 0.52 [0.43, 0.61]     | 7.64       |
| Wojna et al. (2007)                  | 0.68 [0.57, 0.80]       | 7.34       |
| Zamudio-Rodriguez et al. (2018)      | 0.66 [0.60, 0.72]       | 7.91       |

Overall

Heterogeneity: $\tau^2 = 0.03$, $I^2 = 95.71\%$, $H^2 = 23.31$

Test of $\theta = 0$; $Q(12) = 274.18$, $p = 0.00$

Test of $\theta = 0$; $z = 10.83$, $p = 0.00$

Random-effects REML model

Supplementary Figure 5: Forest plot including studies from Middle East & North Africa.

| Study                               | Effect Size with 95% CI | Weight (%) |
|-------------------------------------|-------------------------|------------|
| Elham et al. (2020)                 | 0.51 [0.40, 0.61]       | 100.00     |

Overall

Heterogeneity: $\tau^2 = 0.00$, $I^2 = .\%$, $H^2 = .$

Test of $\theta = 0$; $Q(0) = 0.00$, $p = .$

Test of $\theta = 0$; $z = 9.76$, $p = 0.00$

Random-effects REML model
Supplementary Figure 6: Forest plot including studies from North America.

| Study                                      | Effect Size with 95% CI | Weight (%) |
|--------------------------------------------|-------------------------|------------|
| Arentoft et al. (2015)                     | 0.68 [0.60, 0.76]       | 1.83       |
| Atkins et al. (2010)                       | 0.49 [0.43, 0.54]       | 1.88       |
| Banerjee, McIntosh & Ironson (2019)        | 0.15 [0.10, 0.20]       | 1.89       |
| Becker et al. (2004)                       | 0.20 [0.16, 0.25]       | 1.89       |
| Boccellari et al. (1993)                   | 0.22 [0.11, 0.33]       | 1.75       |
| Bornstein et al. (1993)                    | 0.13 [0.08, 0.17]       | 1.89       |
| Bourgeois et al. (2020)                    | 0.34 [0.29, 0.39]       | 1.89       |
| Brouillette et al. (2015)                  | 0.33 [0.26, 0.40]       | 1.86       |
| Brouillette et al. (2021)                  | 0.52 [0.46, 0.59]       | 1.87       |
| Bryant et al. (2015)                       | 0.58 [0.49, 0.67]       | 1.81       |
| Carvalhal et al. (2016)                    | 0.60 [0.55, 0.65]       | 1.89       |
| Chang et al. (2011)                        | 0.42 [0.30, 0.54]       | 1.73       |
| Cross et al. (2013)                        | 0.41 [0.37, 0.45]       | 1.90       |
| Crum-Cianflone et al. (2013)               | 0.19 [0.14, 0.24]       | 1.88       |
| Dampier et al. (2017)                      | 0.59 [0.50, 0.68]       | 1.80       |
| Deiss et al. (2019)                        | 0.19 [0.13, 0.24]       | 1.88       |
| Derry et al. (2020)                        | 0.35 [0.28, 0.42]       | 1.84       |
| Dufour et al. (2013)                       | 0.22 [0.18, 0.27]       | 1.89       |
| Erlandson et al. (2019)                    | 0.17 [0.15, 0.19]       | 1.92       |
| Fazeli, Woods & Vance (2019)               | 0.53 [0.46, 0.60]       | 1.84       |
| Ferrando et al. (2003)                     | 0.62 [0.54, 0.70]       | 1.83       |
| Foley et al. (2013)                        | 0.22 [0.12, 0.31]       | 1.80       |
| Gandhi et al. (2011)                       | 0.86 [0.80, 0.92]       | 1.86       |
| Gomez et al. (2019)                        | 0.21 [0.17, 0.25]       | 1.90       |
| Greene et al. (2015)                       | 0.47 [0.39, 0.54]       | 1.83       |
| Groff et al. (2020)                        | 0.38 [0.27, 0.49]       | 1.75       |
| Haiman et al. (2014)                       | 0.48 [0.37, 0.59]       | 1.76       |
| Hanna et al. (2020)                        | 0.37 [0.28, 0.46]       | 1.80       |
| Janssen et al. (2015)                      | 0.20 [0.12, 0.28]       | 1.83       |
| Kalajian et al. (2014)                     | 0.23 [0.17, 0.28]       | 1.88       |
| Kalajian et al. (2019)                     | 0.24 [0.22, 0.26]       | 1.92       |
| Kallianpur et al. (2016)                   | 0.36 [0.34, 0.39]       | 1.91       |
| Klusman et al. (1991)                      | 0.38 [0.29, 0.47]       | 1.79       |
| Kupprat et al. (2017)                      | 0.24 [0.17, 0.30]       | 1.86       |
| Matchanova et al. (2020)                   | 0.60 [0.52, 0.68]       | 1.83       |
| Mayeux et al. (1993)                       | 0.44 [0.35, 0.53]       | 1.80       |
| McCutchan et al. (2007)                    | 0.27 [0.22, 0.32]       | 1.88       |
| Milanini et al. (2020)                     | 0.53 [0.41, 0.64]       | 1.74       |
| Moore et al. (2012)                        | 0.19 [0.14, 0.24]       | 1.88       |
| Naveed et al. (2021)                       | 0.39 [0.36, 0.42]       | 1.91       |
| Nichols et al. (2013)                      | 0.65 [0.58, 0.71]       | 1.86       |
| Overton et al. (2013)                      | 0.51 [0.44, 0.58]       | 1.85       |
| Robertson et al. (2019)                    | 0.41 [0.40, 0.43]       | 1.92       |
Supplementary Figure 7: Forest plot including studies from South Asia.

| Study                          | Effect Size with 95% CI | Weight (%) |
|-------------------------------|-------------------------|------------|
| Agarwal et al. (2020)         | 0.52 [0.45, 0.60]       | 10.12      |
| Cook et al. (2014)            | 0.36 [0.25, 0.47]       | 9.57       |
| Cook et al. (2016)            | 0.57 [0.46, 0.68]       | 9.57       |
| Gupta & Venugopal (2020)      | 0.48 [0.43, 0.53]       | 10.49      |
| Gupta et al. (2007)           | 0.61 [0.52, 0.69]       | 9.95       |
| Kamat et al. (2017)           | 0.33 [0.22, 0.44]       | 9.51       |
| Kumar et al. (2019)           | 0.21 [0.15, 0.27]       | 10.42      |
| Madan, Singh & Golechha (1997)| 0.10 [0.06, 0.15]       | 10.53      |
| Saini & Barar (2016)          | 0.32 [0.22, 0.43]       | 9.68       |
| Tighman et al. (2014)         | 0.36 [0.29, 0.44]       | 10.15      |
| **Overall**                   | 0.39 [0.28, 0.49]       |            |

Heterogeneity: $\tau^2 = 0.02$, $I^2 = 94.70\%$, $H^2 = 18.88$

Test of $\theta = \theta_0$: $Q(9) = 226.54$, $p = 0.00$

Test of $\theta = 0$: $z = 7.51$, $p = 0.00$

Random-effects REML model
Supplementary Figure 8: Forest plot including studies from Sub-Saharan Africa.

| Study                                      | Effect Size with 95% CI | Weight (%) |
|---------------------------------------------|-------------------------|------------|
| Akena et al. (2010)                         | 0.70 [0.59, 0.81]       | 2.00       |
| Akolo et al. (2014)                         | 0.31 [0.23, 0.39]       | 2.07       |
| Animut et al. (2019)                        | 0.67 [0.64, 0.71]       | 2.13       |
| Araya et al. (2020)                         | 0.36 [0.32, 0.39]       | 2.12       |
| Asiedu, Kretchy & Asampong (2020)           | 0.48 [0.38, 0.58]       | 2.04       |
| Atashili et al. (2013)                      | 0.85 [0.82, 0.88]       | 2.13       |
| Awori et al. (2018)                         | 0.69 [0.63, 0.75]       | 2.10       |
| Belete, Medfu & Yemiyamrew (2017)           | 0.33 [0.27, 0.39]       | 2.10       |
| Bharti et al. (2021)                        | 0.28 [0.21, 0.34]       | 2.09       |
| Flatt et al. (2021)                         | 0.47 [0.41, 0.53]       | 2.10       |
| Ganasen et al. (2008)                       | 0.17 [0.14, 0.20]       | 2.13       |
| Goodkin et al. (2014)                       | 0.43 [0.31, 0.55]       | 1.99       |
| Hestad et al. (2019)                        | 0.37 [0.31, 0.42]       | 2.10       |
| Hoiguin et al. (2011)                       | 0.22 [0.11, 0.33]       | 2.01       |
| Imam (2007)                                 | 0.12 [0.08, 0.17]       | 2.12       |
| Joska et al. (2016)                         | 0.18 [0.08, 0.28]       | 2.03       |
| Joska et al. (2019)                         | 0.76 [0.70, 0.83]       | 2.09       |
| Jumare et al. (2019)                        | 0.24 [0.18, 0.30]       | 2.10       |
| Kabuba et al. (2017)                        | 0.35 [0.29, 0.40]       | 2.10       |
| Kalungwana et al. (2014)                    | 0.50 [0.37, 0.63]       | 1.96       |
| Kelly et al. (2014)                         | 0.70 [0.61, 0.79]       | 2.06       |
| Lawler et al. (2010)                        | 0.38 [0.29, 0.47]       | 2.06       |
| Lawler et al. (2011)                        | 0.37 [0.25, 0.49]       | 1.98       |
| Milanini et al. (2017)                      | 0.38 [0.36, 0.40]       | 2.14       |
| Mogambery et al. (2017)                     | 0.53 [0.45, 0.61]       | 2.07       |
| Mohamed, Oduor & Kinyanjui (2020)           | 0.81 [0.77, 0.85]       | 2.12       |
| Molinaro et al. (2020)                      | 0.59 [0.54, 0.64]       | 2.11       |
| Mugenci et al. (2019)                       | 0.12 [0.09, 0.16]       | 2.13       |
| Nakk, Kinyada & Hoskins (2013)              | 0.64 [0.61, 0.68]       | 2.12       |
| Namagga et al. (2019)                       | 0.58 [0.53, 0.63]       | 2.11       |
| Njamnshi et al. (2008)                      | 0.21 [0.16, 0.27]       | 2.11       |
| Nyamayaro et al. (2020)                     | 0.50 [0.42, 0.58]       | 2.07       |
| Odiase, Ogunrin & Ogunniiyi (2006)          | 0.66 [0.59, 0.72]       | 2.09       |
| Oshinaike et al. (2012)                     | 0.03 [0.01, 0.05]       | 2.14       |
| Patel et al. (2010)                         | 0.14 [0.09, 0.19]       | 2.11       |
| Robbins et al. (2011)                       | 0.80 [0.70, 0.90]       | 2.04       |
| Ruhanya et al. (2020)                       | 0.37 [0.29, 0.44]       | 2.07       |
| Sacktor et al. (2016)                       | 0.92 [0.87, 0.97]       | 2.11       |
| Salahuddin et al. (2020)                    | 0.39 [0.33, 0.45]       | 2.10       |
| Salawu et al. (2008)                        | 0.57 [0.44, 0.69]       | 1.97       |
| Sanmarti et al. (2020)                      | 0.19 [0.14, 0.24]       | 2.11       |
| Tomita et al. (2019)                        | 0.44 [0.36, 0.51]       | 2.07       |
| Tsegaw et al. (2017)                        | 0.36 [0.33, 0.40]       | 2.12       |
Wubetu, Asefa & Gebregiorgis (2021) 0.41 [0.36, 0.46] 2.12
Yakasai et al. (2015) 0.76 [0.67, 0.86] 2.04
Yechoor et al. (2016) 0.38 [0.31, 0.45] 2.08
Yideg et al. (2019) 0.36 [0.31, 0.41] 2.11
Yusuf et al. (2017) 0.22 [0.18, 0.25] 2.12

**Overall**

Heterogeneity: $\tau^2 = 0.05$, $I^2 = 98.64\%$, $H^2 = 73.59$
Test of $\theta_1 = \theta_0$: $Q(47) = 4447.12$, $p = 0.00$
Test of $\theta = 0$: $z = 13.92$, $p = 0.00$

Random-effects REML model
Supplementary Figure 9: Forest plot of study subgroups by neurological assessment type. The subgroup “other criteria” refers to six studies using unvalidated approaches. Figure made using STATA.

| Neurological Assessment (by type & criteria) | Effect Size with 95% CI | Weight (%) |
|---------------------------------------------|-------------------------|------------|
| **Diagnostic Method**                       |                         |            |
| Frascati                                    | 0.44 [0.39, 0.49]        | 26.17      |
| Frascati (uncategorised)                    | 0.41 [0.35, 0.47]        | 14.08      |
| Frascati (HAD only)                         | 0.25 [0.17, 0.34]        | 4.01       |
| Gisslen (uncategorised)                     | 0.16 [0.11, 0.21]        | 1.35       |
| GDS                                         | 0.37 [0.33, 0.42]        | 15.60      |
| T-Score                                     | 0.28 [0.16, 0.40]        | 1.34       |
| clinical NP ratings                         | 0.43 [0.27, 0.58]        | 1.77       |
| MNC                                         | 0.17 [0.05, 0.28]        | 1.34       |
| NMM                                         | 0.31 [0.12, 0.50]        | 0.90       |
| **Screening Method**                        |                         |            |
| IHDS                                        | 0.44 [0.37, 0.51]        | 12.93      |
| HDS                                         | 0.27 [0.09, 0.46]        | 2.24       |
| CSID                                        | 0.42 [-0.04, 0.89]       | 0.88       |
| MoCA                                       | 0.57 [0.46, 0.67]        | 6.26       |
| BNCS                                        | 0.39 [0.23, 0.55]        | 1.38       |
| MMSE                                        | 0.29 [0.20, 0.38]        | 7.07       |
| **other criteria**                          |                         |            |
| mixed                                       | 0.28 [0.14, 0.43]        | 2.63       |
| **Overall (225 studies)**                  |                         |            |
| Heterogeneity: $\tau^2 = 0.04$, $I^2 = 98.16\%$, $H^2 = 54.26$ | 0.40 [0.37, 0.42] |  |
| Test of $\theta_i = \theta$; $Q(224) = 13833.19$, $p = 0.00$ |  |  |
| **By individual criteria:**                |                         |            |
| Test of group differences: $Q_{(15)} = 110.23$, $p = 0.00$ |  |  |
| **Between assessment types:**              |                         |            |
| Test of group differences: $Q_{(2)} = 3.25$, $p = 0.20$ |  |  |
| Random-effects REML model                   |                         |            |
Supplementary Figure 10: Forest plot including studies categorised as a diagnostic method.

| Study                  | Effect Size with 95% CI | Weight (%) |
|------------------------|------------------------|------------|
| **Frascati**           |                        |            |
| Arentoft et al. (2015) | 0.68 [0.60, 0.76]      | 0.66       |
| Bai et al. (2017)      | 0.32 [0.25, 0.40]      | 0.67       |
| Bloch et al. (2016)    | 0.31 [0.25, 0.36]      | 0.68       |
| Chan et al. (2019)     | 0.23 [0.16, 0.30]      | 0.67       |
| Chang et al. (2011)    | 0.42 [0.30, 0.54]      | 0.63       |
| Ciccarelli et al. (2013)| 0.50 [0.40, 0.59]    | 0.65       |
| Ciccarelli et al. (2019)| 0.47 [0.39, 0.55]   | 0.66       |
| Darling et al. (2021)  | 0.40 [0.37, 0.43]      | 0.69       |
| de Almeida et al. (2017)| 0.60 [0.48, 0.72]    | 0.62       |
| Donne et al. (2020)    | 0.07 [0.02, 0.12]      | 0.68       |
| Dufouil et al. (2015)  | 0.58 [0.54, 0.63]      | 0.69       |
| Elham et al. (2020)    | 0.51 [0.40, 0.61]      | 0.64       |
| Fabbiani et al. (2019) | 0.16 [0.12, 0.21]      | 0.69       |
| Flatt et al. (2021)    | 0.47 [0.41, 0.53]      | 0.68       |
| Foca et al. (2016)     | 0.47 [0.40, 0.54]      | 0.67       |
| Gandhi et al. (2011)   | 0.86 [0.80, 0.92]      | 0.68       |
| Gascon et al. (2018)   | 0.74 [0.69, 0.78]      | 0.69       |
| Gomez et al. (2019)    | 0.21 [0.17, 0.25]      | 0.69       |
| Grauer et al. (2015)   | 0.87 [0.80, 0.94]      | 0.67       |
| Grima et al. (2012)    | 0.47 [0.38, 0.56]      | 0.65       |
| Groff et al. (2020)    | 0.38 [0.27, 0.49]      | 0.64       |
| Haddow et al. (2018)   | 0.26 [0.22, 0.30]      | 0.69       |
| Hanna et al. (2020)    | 0.37 [0.28, 0.46]      | 0.65       |
| Imai et al. (2020)     | 0.26 [0.22, 0.30]      | 0.69       |
| Janssen et al. (1989)  | 0.41 [0.31, 0.51]      | 0.65       |
| Joska et al. (2011)    | 0.74 [0.67, 0.81]      | 0.67       |
| Joska et al. (2019)    | 0.76 [0.70, 0.83]      | 0.68       |
| Jumare et al. (2019)   | 0.24 [0.18, 0.30]      | 0.68       |
| Kamal et al. (2017)    | 0.27 [0.16, 0.38]      | 0.63       |
| Kelly et al. (2014)    | 0.70 [0.61, 0.79]      | 0.66       |
| Kim et al. (2016)      | 0.26 [0.20, 0.32]      | 0.68       |
| Kinai et al. (2017)    | 0.25 [0.22, 0.28]      | 0.69       |
| Korten et al. (2021)   | 0.46 [0.38, 0.53]      | 0.67       |
| Ku et al. (2014)       | 0.26 [0.20, 0.32]      | 0.68       |
| Libertone et al. (2014)| 0.32 [0.28, 0.36]      | 0.69       |
| Lu et al. (2014)       | 0.49 [0.36, 0.62]      | 0.61       |
| Makinson et al. (2020) | 0.35 [0.29, 0.42]      | 0.67       |
| Marin-Webb et al. (2016)| 0.43 [0.39, 0.47]    | 0.69       |
| Metral et al. (2020)   | 0.27 [0.24, 0.30]      | 0.69       |
| Milanini et al. (2020) | 0.53 [0.41, 0.64]      | 0.63       |
| Munoz-Moreno et al. (2008)| 0.48 [0.38, 0.58]  | 0.65       |
| Munoz-Moreno et al. (2010)| 0.42 [0.32, 0.53]  | 0.64       |
| Perez-Valero et al. (2013)| 0.27 [0.21, 0.34] | 0.68       |
| Study                                      | Effect Size | 95% CI     | p     |
|-------------------------------------------|-------------|------------|-------|
| Portilla et al. (2019)                    | 0.30 [ 0.20, 0.40] | 0.65       |
| Pumpraudit et al. (2010)                  | 0.38 [ 0.26, 0.49] | 0.63       |
| Sacktor et al. (2014)                     | 0.33 [ 0.28, 0.38] | 0.69       |
| Sacktor et al. (2016)                     | 0.92 [ 0.87, 0.97] | 0.69       |
| Simioni et al. (2010)                     | 0.84 [ 0.79, 0.89] | 0.68       |
| Trunfo et al. (2018)                      | 0.22 [ 0.18, 0.25] | 0.69       |
| Valcour et al. (2013)                     | 0.46 [ 0.33, 0.58] | 0.62       |
| Vassallo et al. (2015)                    | 0.30 [ 0.24, 0.36] | 0.68       |
| Vergori et al. (2019)                     | 0.23 [ 0.19, 0.26] | 0.69       |
| Wojna et al. (2007)                       | 0.68 [ 0.57, 0.80] | 0.63       |
| Yakasai et al. (2015)                     | 0.76 [ 0.67, 0.86] | 0.65       |
| Yusuf et al. (2017)                       | 0.22 [ 0.18, 0.25] | 0.69       |
| Zaegel-Faucher et al. (2020)              | 0.57 [ 0.48, 0.66] | 0.66       |
| Zamudio-Rodiguez et al. (2018)            | 0.66 [ 0.60, 0.72] | 0.68       |
| Zhang et al. (2012)                       | 0.37 [ 0.29, 0.45] | 0.66       |
| Zhao et al. (2015)                        | 0.37 [ 0.31, 0.44] | 0.68       |

**Heterogeneity:** $\tau^2 = 0.04, I^2 = 97.92\%, H^2 = 48.02$

Test of $\theta_i = \theta$: $Q(58) = 2969.35, p = 0.00$

**Frascati (HAD)**

| Study                                      | Effect Size | 95% CI     | p     |
|-------------------------------------------|-------------|------------|-------|
| Brouillette et al. (2015)                 | 0.33 [ 0.26, 0.40] | 0.68       |
| de Ronchi, Faranca & Berardi (2002)       | 0.20 [ 0.14, 0.26] | 0.68       |
| Falide-Garrido et al. (2008)              | 0.52 [ 0.42, 0.63] | 0.64       |
| Grund et al. (2013)                       | 0.14 [ 0.09, 0.18] | 0.69       |
| Janssen et al. (2015)                     | 0.20 [ 0.12, 0.28] | 0.66       |
| Klusman et al. (1991)                     | 0.38 [ 0.29, 0.47] | 0.65       |
| Pereda et al. (2000)                      | 0.27 [ 0.18, 0.36] | 0.66       |
| van Gorp et al. (1999)                    | 0.16 [ 0.10, 0.23] | 0.68       |
| Wright et al. (2008)                      | 0.12 [ 0.09, 0.14] | 0.70       |

**Heterogeneity:** $\tau^2 = 0.02, I^2 = 94.90\%, H^2 = 19.60$

Test of $\theta_i = \theta$: $Q(8) = 113.01, p = 0.00$

**Frascati (uncategorised)**

| Study                                      | Effect Size | 95% CI     | p     |
|-------------------------------------------|-------------|------------|-------|
| Alford et al. (2019)                      | 0.31 [ 0.18, 0.44] | 0.62       |
| Arenas-Pinto et al. (2014)                | 0.52 [ 0.48, 0.56] | 0.69       |
| Bryant et al. (2015)                      | 0.58 [ 0.49, 0.67] | 0.66       |
| Bunupuradah et al. (2012)                 | 0.31 [ 0.22, 0.41] | 0.65       |
| Casado et al. (2014)                      | 0.13 [ 0.09, 0.17] | 0.69       |
| Chan et al. (2021)                        | 0.30 [ 0.19, 0.41] | 0.64       |
| Cook et al. (2016)                        | 0.57 [ 0.46, 0.68] | 0.64       |
| Dwyer et al. (2014)                       | 0.69 [ 0.56, 0.82] | 0.62       |
| Erlanson et al. (2019)                    | 0.17 [ 0.15, 0.19] | 0.70       |
| Estiasari et al. (2015)                   | 0.51 [ 0.40, 0.62] | 0.64       |
| Fabbiani et al. (2017)                    | 0.13 [ 0.04, 0.22] | 0.66       |
| Ferrando et al. (2003)                    | 0.62 [ 0.54, 0.70] | 0.66       |
| Garvey, Surendrakumar & Winston (2011)    | 0.19 [ 0.11, 0.27] | 0.67       |
| Goodkin et al. (2014)                     | 0.43 [ 0.31, 0.55] | 0.63       |
| Study                          | T Score | Test of Heterogeneity | Q (df) | p Value |
|-------------------------------|---------|-----------------------|--------|---------|
| Gupta & Venugopal (2020)      | 0.48 [0.43, 0.53] | 0.68 |
| Halman et al. (2014)          | 0.48 [0.37, 0.59] | 0.64 |
| Lawler et al. (2011)          | 0.37 [0.25, 0.49] | 0.62 |
| Mayeux et al. (1993)          | 0.44 [0.35, 0.53] | 0.65 |
| McCutchan et al. (2007)       | 0.27 [0.22, 0.32] | 0.68 |
| Milanini et al. (2017)        | 0.38 [0.36, 0.40] | 0.70 |
| Munoz-Moreno et al. (2013)    | 0.61 [0.49, 0.73] | 0.62 |
| Robertson et al. (2014)       | 0.45 [0.42, 0.48] | 0.69 |
| Rodrigues et al. (2013)       | 0.52 [0.45, 0.60] | 0.67 |
| Salawu et al. (2008)          | 0.57 [0.44, 0.69] | 0.62 |
| Sanmarti et al. (2020)        | 0.19 [0.14, 0.24] | 0.68 |
| Sevigny et al. (2007)         | 0.69 [0.63, 0.74] | 0.68 |
| Sheppard et al. (2015)        | 0.16 [0.08, 0.24] | 0.66 |
| Stern et al. (1991)           | 0.58 [0.49, 0.67] | 0.66 |
| Thiyagarajan et al. (2010)    | 0.18 [0.09, 0.27] | 0.66 |
| Tozzi et al. (2005)           | 0.54 [0.50, 0.59] | 0.69 |
| Winston et al. (2013)         | 0.51 [0.47, 0.55] | 0.69 |
| Wright et al. (2015)          | 0.20 [0.17, 0.23] | 0.69 |
| Heterogeneity: $\tau^2 = 0.03$, $I^2 = 97.55\%$, $H^2 = 40.90$ | $Q(31) = 1170.36$, p = 0.00 |

| Study                          | T Score | Test of Heterogeneity | Q (df) | p Value |
|-------------------------------|---------|-----------------------|--------|---------|
| Akolo et al. (2014)           | 0.31 [0.23, 0.39] | 0.66 |
| Aung et al. (2021)            | 0.42 [0.36, 0.48] | 0.68 |
| Bharti et al. (2021)          | 0.28 [0.21, 0.34] | 0.67 |
| Braganca & Palha (2011)       | 0.51 [0.42, 0.60] | 0.66 |
| Brouillette et al. (2021)     | 0.52 [0.46, 0.59] | 0.68 |
| Carvalhal et al. (2016)       | 0.60 [0.55, 0.65] | 0.69 |
| Crum-Cianflone et al. (2013)  | 0.19 [0.14, 0.24] | 0.68 |
| Cysique et al. (2010)         | 0.43 [0.36, 0.50] | 0.67 |
| Dampier et al. (2017)         | 0.59 [0.50, 0.68] | 0.65 |
| Day et al. (2016)             | 0.27 [0.22, 0.32] | 0.69 |
| Deiss et al. (2019)           | 0.19 [0.13, 0.24] | 0.68 |
| Dufour et al. (2013)          | 0.22 [0.18, 0.27] | 0.69 |
| Ene et al. (2016)             | 0.37 [0.30, 0.43] | 0.67 |
| Foley et al. (2013)           | 0.22 [0.12, 0.31] | 0.65 |
| Gott et al. (2017)            | 0.55 [0.45, 0.65] | 0.65 |
| Heaton et al. (2008)          | 0.35 [0.29, 0.42] | 0.67 |
| Hestad et al. (2019)          | 0.37 [0.31, 0.42] | 0.68 |
| Jumare et al. (2020)          | 0.28 [0.25, 0.31] | 0.69 |
| Kabuba et al. (2017)          | 0.35 [0.29, 0.40] | 0.68 |
| Kalayjian et al. (2014)       | 0.23 [0.17, 0.28] | 0.68 |
| Kallianpur et al. (2016)      | 0.36 [0.34, 0.39] | 0.69 |
| Kamat et al. (2017)           | 0.33 [0.22, 0.44] | 0.63 |
| Kamminga et al. (2017)        | 0.47 [0.34, 0.60] | 0.61 |
| Matchanova et al. (2020)      | 0.60 [0.52, 0.68] | 0.66 |
| Moore et al. (2012)           | 0.19 [0.14, 0.24] | 0.68 |
Nichols et al. (2013)  0.65 [ 0.58, 0.71]  0.68
Nyamayaro et al. (2020)  0.50 [ 0.42, 0.58]  0.66
Ruhanya et al. (2020)  0.37 [ 0.29, 0.44]  0.67
Spector et al. (2010)  0.37 [ 0.30, 0.43]  0.67
Sundermann et al. (2018)  0.43 [ 0.40, 0.45]  0.69
Temereanca et al. (2020)  0.35 [ 0.29, 0.41]  0.68
Tlighman et al. (2014)  0.36 [ 0.29, 0.44]  0.67
van den Dries et al. (2017)  0.41 [ 0.29, 0.52]  0.63
Vitiello et al. (2007)  0.19 [ 0.13, 0.25]  0.68
Yechoor et al. (2016)  0.38 [ 0.31, 0.45]  0.67
Heterogeneity: $\tau^2 = 0.02$, $I^2 = 95.01\%$, $H^2 = 20.06$ Test of $\theta_i = \theta; Q(34) = 603.77$, $p = 0.00$

Gisslen
Boccellari et al. (1993)  0.22 [ 0.11, 0.33]  0.64
Ciccarelli et al. (2011)  0.12 [ 0.09, 0.15]  0.69
Starace et al. (2002)  0.18 [ 0.14, 0.22]  0.69
Heterogeneity: $\tau^2 = 0.00$, $I^2 = 71.57\%$, $H^2 = 3.52$ Test of $\theta_i = \theta; Q(2) = 7.13$, $p = 0.03$

MNC
Davies et al. (2019)  0.28 [ 0.18, 0.38]  0.65
Su et al. (2016)  0.17 [ 0.10, 0.24]  0.67
Wang et al. (2019)  0.08 [ 0.06, 0.09]  0.70
Heterogeneity: $\tau^2 = 0.01$, $I^2 = 90.70\%$, $H^2 = 10.76$ Test of $\theta_i = \theta; Q(21) = 21.71$, $p = 0.00$

NMM
Kemp et al. (2021)  0.41 [ 0.33, 0.49]  0.66
Underwood et al. (2019)  0.21 [ 0.18, 0.25]  0.69
Heterogeneity: $\tau^2 = 0.02$, $I^2 = 94.66\%$, $H^2 = 18.74$ Test of $\theta_i = \theta; Q(1) = 18.74$, $p = 0.00$

T-Score
Fabbiani et al. (2018)  0.24 [ 0.17, 0.31]  0.67
Karlsen, Froland & Reinvang (1994)  0.19 [ 0.08, 0.30]  0.64
Naveed et al. (2021)  0.39 [ 0.36, 0.42]  0.69
Heterogeneity: $\tau^2 = 0.01$, $I^2 = 90.23\%$, $H^2 = 10.23$ Test of $\theta_i = \theta; Q(2) = 24.22$, $p = 0.00$

clinical NP ratings
Atkins et al. (2010)  0.49 [ 0.43, 0.54]  0.68
Becker et al. (2004)  0.20 [ 0.16, 0.25]  0.69
Chalermchai et al. (2013)  0.51 [ 0.40, 0.62]  0.63
Fazeli, Woods & Vance (2019)  0.53 [ 0.46, 0.60]  0.67
Heterogeneity: $\tau^2 = 0.02$, $I^2 = 95.68\%$, $H^2 = 23.17$ Test of $\theta_i = \theta; Q(3) = 93.10$, $p = 0.00$
Random-effects REML model

Supplementary Figure 11: Forest plot including studies categorised as a screening method.

| Study                          | Effect Size with 95% CI | Weight (%) |
|--------------------------------|-------------------------|------------|
| BNCS                           |                         |            |
| Kalayjian et al. (2019)        | 0.24 [ 0.22, 0.26]      | 1.49       |
| McNamara et al. (2017)         | 0.51 [ 0.48, 0.55]      | 1.48       |
| Robertson et al. (2019)        | 0.41 [ 0.40, 0.43]      | 1.49       |
| Heterogeneity: $\tau^2 = 0.02$, $I^2 = 99.29\%$, $H^2 = 140.28$ | 0.39 [ 0.23, 0.55]      | 1.49       |
| Test of $\theta_i = \theta_j$; $Q(2) = 246.50$, $p = 0.00$ |                         |            |
| CSID                           |                         |            |
| Joska et al. (2016)            | 0.18 [ 0.08, 0.28]      | 1.40       |
| Odiasa, Oggunrin & Ogunnyi (2006) | 0.66 [ 0.59, 0.72]    | 1.45       |
| Heterogeneity: $\tau^2 = 0.11$, $I^2 = 98.27\%$, $H^2 = 57.91$ | 0.42 [-0.04, 0.89]   |            |
| Test of $\theta_i = \theta_j$; $Q(1) = 57.91$, $p = 0.00$ |                         |            |
| HDS                            |                         |            |
| Banerjee, McIntosh & Ironson (2019) | 0.15 [ 0.10, 0.20]   | 1.47       |
| Fialho et al. (2013)           | 0.57 [ 0.48, 0.67]      | 1.42       |
| Ganasen et al. (2008)          | 0.17 [ 0.14, 0.20]      | 1.48       |
| Gibbie et al. (2006)           | 0.07 [ 0.03, 0.11]      | 1.48       |
| Jevtic et al. (2009)           | 0.42 [ 0.32, 0.52]      | 1.41       |
| Heterogeneity: $\tau^2 = 0.04$, $I^2 = 98.31\%$, $H^2 = 59.00$ | 0.27 [ 0.09, 0.46]   |            |
| Test of $\theta_i = \theta_j$; $Q(4) = 112.98$, $p = 0.00$ |                         |            |
| IHDS                           |                         |            |
| Animut et al. (2019)           | 0.67 [ 0.64, 0.71]      | 1.48       |
| Araya et al. (2020)            | 0.36 [ 0.32, 0.39]      | 1.48       |
| Asiedu, Kretchy & Asampong (2020) | 0.48 [ 0.38, 0.58]    | 1.41       |
| Atashili et al. (2013)         | 0.85 [ 0.82, 0.88]      | 1.48       |
| Barber et al. (2017)           | 0.22 [ 0.15, 0.28]      | 1.45       |
| Belete, Medfu & Yemiyanrew (2017) | 0.33 [ 0.27, 0.39]  | 1.46       |
| Chan et al. (2012)             | 0.39 [ 0.29, 0.49]      | 1.41       |
| Cook et al. (2014)             | 0.36 [ 0.25, 0.47]      | 1.39       |
| Cross et al. (2013)            | 0.41 [ 0.37, 0.45]      | 1.48       |
| Dang et al. (2015)             | 0.38 [ 0.31, 0.44]      | 1.46       |
| Ding et al. (2017)             | 0.47 [ 0.41, 0.52]      | 1.47       |
| Study                          | Effect Size | 95% CI     | p   |
|-------------------------------|-------------|------------|-----|
| **MMSE**                      |             |            |     |
| Akena et al. (2010)           | 0.70        | [0.59, 0.81] | 1.39 |
| Cruz & Ramos (2015)           | 0.28        | [0.21, 0.35] | 1.45 |
| Filho & de Melo (2012)        | 0.37        | [0.23, 0.50] | 1.35 |
| Imam (2007)                   | 0.12        | [0.08, 0.17] | 1.48 |
| Kalungwana et al. (2014)      | 0.50        | [0.37, 0.63] | 1.36 |
| Kumar et al. (2019)           | 0.21        | [0.15, 0.27] | 1.47 |
| Kupprat et al. (2017)         | 0.24        | [0.17, 0.30] | 1.46 |
| Madan, Singh & Golechha (1997)| 0.10        | [0.06, 0.15] | 1.47 |
| Oshinaike et al. (2012)       | 0.03        | [0.01, 0.05] | 1.49 |
| Qiao et al. (2019)            | 0.12        | [0.10, 0.15] | 1.49 |
| Sereia et al. (2012)          | 0.27        | [0.18, 0.36] | 1.43 |
| Suarez et al. (2001)          | 0.58        | [0.48, 0.68] | 1.41 |
| Tamargo et al. (2021)         | 0.15        | [0.11, 0.18] | 1.48 |
| Tremont-Lukats, Teixeira & Hernandez (1999) | 0.36       | [0.25, 0.47] | 1.39 |
| Widyadharma et al. (2017)     | 0.33        | [0.24, 0.43] | 1.42 |
| Wubetu, Asefa & Gebregiorgis (2021) | 0.41     | [0.36, 0.46] | 1.47 |
| **Heterogeneity:** $r^2 = 0.03$, $I^2 = 98.01\%$, $H^2 = 50.35$ | 0.29        | [0.20, 0.38] |     |
| **Test of $\theta_i = \theta$: Q(15) = 496.86, p = 0.00** |            |            |     |
| **MoCA**                      |             |            |     |
| Agarwal et al. (2020)         | 0.52        | [0.45, 0.60] | 1.44 |
| Awori et al. (2018)           | 0.69        | [0.63, 0.75] | 1.46 |
| Bourgeois et al. (2020)       | 0.34        | [0.29, 0.39] | 1.47 |
| Brito-Marques et al. (2020)   | 0.83        | [0.77, 0.90] | 1.46 |
| Derry et al. (2020)           | 0.35        | [0.28, 0.42] | 1.45 |
| Fitri, Rambe & Fitri (2018)   | 0.75        | [0.66, 0.84] | 1.42 |
Random-effects REML model

Supplementary Figure 12: Forest plot including studies categorised as other criteria.

| Study                      | Effect Size with 95% CI | Weight (%) |
|----------------------------|-------------------------|------------|
| **other criteria**         |                         |            |
| Bornstein et al. (1993)    | 0.13 [0.08, 0.17]       | 17.18      |
| Gupta et al. (2007)        | 0.61 [0.52, 0.69]       | 16.40      |
| Maj et al. (1994)          | 0.13 [0.10, 0.16]       | 17.34      |
| Valcour et al. (2004)      | 0.20 [0.14, 0.25]       | 17.02      |
| Villa et al. (1996)        | 0.28 [0.18, 0.38]       | 16.12      |
| Wilkins et al. (1991)      | 0.36 [0.26, 0.47]       | 15.93      |
| **Overall**                |                         |            |
| Heterogeneity: \( \tau^2 = 0.03 \), \( I^2 = 97.57\% \), \( H^2 = 41.18 \) | | |
| Test of \( \theta_i = \theta \); \( Q(5) = 124.38 \), \( p = 0.00 \) | | |
| Heterogeneity: \( \tau^2 = 0.03 \), \( I^2 = 97.57\% \), \( H^2 = 41.18 \) | | |
| Test of \( \theta_i = \theta \); \( Q(5) = 124.38 \), \( p = 0.00 \) | | |
| Test of group differences: \( Q_5(0) = 0.00 \), \( p = . \) | | |
Supplementary Figure 13: Forest plot of study subgroups by income level (country). The subgroup “mixed or unclassified” refers to multi-site studies and studies from Venezuela, which is not classified by The World Bank. Figure made using STATA.

| Country Income Level           | Effect Size with 95% CI | Weight (%) |
|-------------------------------|-------------------------|------------|
| high income                   | 0.37 [0.33, 0.40]       | 52.94      |
| upper middle income           | 0.50 [0.40, 0.60]       | 19.82      |
| lower middle income           | 0.41 [0.34, 0.48]       | 15.91      |
| mixed or unclassified         | 0.31 [0.18, 0.43]       | 4.56       |
| low income                    | 0.45 [0.40, 0.50]       | 6.76       |

**Overall (225 studies)**

Heterogeneity: $\tau^2 = 0.04$, $I^2 = 98.16\%$, $H^2 = 54.26$

Test of $\theta$; $Q(224) = 13833.19$, $p = 0.00$

Test of group differences: $Q(4) = 14.08$, $p = 0.01$

Random-effects REML model

Supplementary Figure 14: Forest plot including studies from high-income countries.

| Study                                | Effect Size with 95% CI | Weight (%) |
|--------------------------------------|-------------------------|------------|
| Alford et al. (2019)                 | 0.31 [0.18, 0.44]       | 0.77       |
| Arenas-Pinto et al. (2014)           | 0.52 [0.48, 0.56]       | 0.87       |
| Arentoft et al. (2015)               | 0.68 [0.60, 0.76]       | 0.84       |
| Atkins et al. (2010)                 | 0.49 [0.43, 0.54]       | 0.86       |
| Aung et al. (2021)                   | 0.42 [0.36, 0.48]       | 0.85       |
| Bai et al. (2017)                    | 0.32 [0.25, 0.40]       | 0.84       |
| Banerjee, McIntosh & Ironson (2019) | 0.15 [0.10, 0.20]       | 0.86       |
| Barber et al. (2017)                 | 0.22 [0.15, 0.28]       | 0.85       |
| Becker et al. (2004)                 | 0.20 [0.16, 0.25]       | 0.86       |
| Bloch et al. (2016)                  | 0.31 [0.25, 0.36]       | 0.86       |
| Boccellari et al. (1993)             | 0.22 [0.11, 0.33]       | 0.80       |
| Bornstein et al. (1993)              | 0.13 [0.08, 0.17]       | 0.87       |
| Bourgeois et al. (2020)              | 0.34 [0.29, 0.39]       | 0.86       |
| Braganca & Palha (2011)              | 0.51 [0.42, 0.60]       | 0.83       |
| Brouillette et al. (2015)            | 0.33 [0.26, 0.40]       | 0.85       |
| Brouillette et al. (2021)            | 0.52 [0.46, 0.59]       | 0.85       |
| Bryant et al. (2015)                 | 0.58 [0.49, 0.67]       | 0.82       |
| Carvalhal et al. (2016)              | 0.60 [0.55, 0.65]       | 0.86       |
| Casado et al. (2014)                 | 0.13 [0.09, 0.17]       | 0.87       |
| Chan et al. (2021)                   | 0.30 [0.19, 0.41]       | 0.80       |
| Chang et al. (2011)                  | 0.42 [0.30, 0.54]       | 0.79       |
| Ciccarelli et al. (2011)             | 0.12 [0.09, 0.15]       | 0.87       |
| Ciccarelli et al. (2013)             | 0.50 [0.40, 0.59]       | 0.81       |
| Ciccarelli et al. (2019)             | 0.47 [0.39, 0.55]       | 0.83       |
| Cross et al. (2013)                  | 0.41 [0.37, 0.45]       | 0.87       |
| Crum-Cianflone et al. (2013)         | 0.19 [0.14, 0.24]       | 0.86       |
| Study                                    | Effect Size | Weight    |
|-----------------------------------------|-------------|-----------|
| Dampier et al. (2017)                   | 0.59 [0.50, 0.68] | 0.82     |
| Darling et al. (2021)                   | 0.40 [0.37, 0.43] | 0.87     |
| Davies et al. (2019)                    | 0.28 [0.18, 0.38] | 0.81     |
| de Ronchi, Faranca & Berardi (2002)     | 0.20 [0.14, 0.26] | 0.86     |
| Deiss et al. (2019)                     | 0.19 [0.13, 0.24] | 0.86     |
| Derry et al. (2020)                     | 0.35 [0.28, 0.42] | 0.84     |
| Donne et al. (2020)                     | 0.07 [0.02, 0.12] | 0.86     |
| Dufouil et al. (2015)                   | 0.58 [0.54, 0.63] | 0.86     |
| Dufour et al. (2013)                    | 0.22 [0.18, 0.27] | 0.87     |
| Erlanson et al. (2019)                  | 0.17 [0.15, 0.19] | 0.88     |
| Fabbiani et al. (2017)                  | 0.13 [0.04, 0.22] | 0.82     |
| Fabbiani et al. (2018)                  | 0.24 [0.17, 0.31] | 0.85     |
| Fabbiani et al. (2019)                  | 0.16 [0.12, 0.21] | 0.87     |
| Falde-Garrido et al. (2008)             | 0.52 [0.42, 0.63] | 0.80     |
| Fazeli, Woods & Vance (2019)            | 0.53 [0.46, 0.60] | 0.84     |
| Ferrando et al. (2003)                  | 0.62 [0.54, 0.70] | 0.83     |
| Fialho et al. (2013)                    | 0.57 [0.48, 0.67] | 0.82     |
| Foca et al. (2016)                      | 0.47 [0.40, 0.54] | 0.85     |
| Foley et al. (2013)                     | 0.22 [0.12, 0.31] | 0.82     |
| Gandhi et al. (2011)                    | 0.86 [0.80, 0.92] | 0.85     |
| Garvey, Surendrakumar & Winston (2011)  | 0.19 [0.11, 0.27] | 0.84     |
| Gibbie et al. (2006)                    | 0.07 [0.03, 0.11] | 0.87     |
| Gomez et al. (2019)                     | 0.21 [0.17, 0.25] | 0.87     |
| Gott et al. (2017)                      | 0.55 [0.45, 0.65] | 0.81     |
| Grauer et al. (2015)                    | 0.87 [0.80, 0.94] | 0.84     |
| Greene et al. (2015)                    | 0.47 [0.39, 0.54] | 0.84     |
| Grima et al. (2012)                     | 0.47 [0.38, 0.56] | 0.82     |
| Groff et al. (2020)                     | 0.38 [0.27, 0.49] | 0.80     |
| Halman et al. (2014)                    | 0.48 [0.37, 0.59] | 0.80     |
| Hanna et al. (2020)                     | 0.37 [0.28, 0.46] | 0.82     |
| Imai et al. (2020)                      | 0.26 [0.22, 0.30] | 0.87     |
| Invernizzi et al. (2018)                | 0.49 [0.37, 0.61] | 0.79     |
| Janssen et al. (1989)                   | 0.41 [0.31, 0.51] | 0.81     |
| Janssen et al. (2015)                   | 0.20 [0.12, 0.28] | 0.84     |
| Kalayjian et al. (2014)                 | 0.23 [0.17, 0.28] | 0.86     |
| Kalayjian et al. (2019)                 | 0.24 [0.22, 0.26] | 0.88     |
| Kallianpur et al. (2016)                | 0.36 [0.34, 0.39] | 0.88     |
| Kamal et al. (2017)                     | 0.27 [0.16, 0.38] | 0.79     |
| Kamminga et al. (2017)                  | 0.47 [0.34, 0.60] | 0.76     |
| Karlsen, Froland & Reinvang (1994)      | 0.19 [0.08, 0.30] | 0.80     |
| Kemp et al. (2021)                      | 0.41 [0.33, 0.49] | 0.83     |
| Kim et al. (2016)                       | 0.26 [0.20, 0.32] | 0.85     |
| Kinai et al. (2017)                     | 0.25 [0.22, 0.28] | 0.87     |
| Klusman et al. (1991)                   | 0.38 [0.29, 0.47] | 0.82     |
| Ku et al. (2014)                        | 0.26 [0.20, 0.32] | 0.85     |
| Kupprat et al. (2017)                   | 0.24 [0.17, 0.30] | 0.85     |
| Libertone et al. (2014)                 | 0.32 [0.28, 0.36] | 0.87     |
Random-effects REML model

- Test of Overall
  - Vergori et al. (2019)
  - van den Dries et al. (2017)
  - Valcour et al. (2004)
  - Thiyagarajan et al. (2010)
  - Tamargo et al. (2021)
  - Suarez et al. (2001)
  - Su et al. (2016)
  - Stern et al. (1991)
  - Simioni et al. (2010)
  - Starace et al. (2002)
  - Stern et al. (1991)
  - Su et al. (2016)
  - Suarez et al. (2001)
  - Sundermann et al. (2018)
  - Tamargo et al. (2021)
  - Thiagarajan et al. (2010)
  - Tozzi et al. (2005)
  - Trufño et al. (2018)
  - Underwood et al. (2019)
  - Valcour et al. (2004)
  - van den Dries et al. (2017)
  - van Gorp et al. (1999)
  - Vassallo et al. (2015)
  - Vergori et al. (2019)
  - Villa et al. (1996)
  - Vitiello et al. (2007)
  - Wang et al. (2019)
  - Wilkins et al. (1991)
  - Winston et al. (2013)
  - Wojna et al. (2007)

\[ \theta = 0: z = 22.56, p = 0.00 \]

\[ \theta_j: Q(118) = 5580.33, p = 0.00 \]

\[ \tau = 0.03, I^2 = 97.96\% \]

\[ H^2 = 0.51 [0.36, 0.79] \]

\[ 0.49 [0.36, 0.62] \]

\[ 0.35 [0.29, 0.42] \]

\[ 0.43 [0.39, 0.47] \]

\[ 0.60 [0.52, 0.68] \]

\[ 0.44 [0.35, 0.53] \]

\[ 0.27 [0.22, 0.32] \]

\[ 0.51 [0.48, 0.55] \]

\[ 0.27 [0.24, 0.30] \]

\[ 0.53 [0.41, 0.64] \]

\[ 0.19 [0.14, 0.24] \]

\[ 0.48 [0.38, 0.58] \]

\[ 0.42 [0.32, 0.53] \]

\[ 0.61 [0.49, 0.73] \]

\[ 0.39 [0.36, 0.42] \]

\[ 0.65 [0.58, 0.71] \]

\[ 0.51 [0.44, 0.58] \]

\[ 0.27 [0.18, 0.36] \]

\[ 0.27 [0.21, 0.34] \]

\[ 0.30 [0.20, 0.40] \]

\[ 0.41 [0.40, 0.43] \]

\[ 0.33 [0.28, 0.38] \]

\[ 0.69 [0.63, 0.74] \]

\[ 0.16 [0.08, 0.24] \]

\[ 0.84 [0.79, 0.89] \]

\[ 0.18 [0.14, 0.22] \]

\[ 0.58 [0.49, 0.67] \]

\[ 0.17 [0.10, 0.24] \]

\[ 0.58 [0.48, 0.68] \]

\[ 0.43 [0.40, 0.45] \]

\[ 0.15 [0.11, 0.18] \]

\[ 0.18 [0.09, 0.27] \]

\[ 0.54 [0.50, 0.59] \]

\[ 0.22 [0.18, 0.25] \]

\[ 0.21 [0.18, 0.25] \]

\[ 0.20 [0.14, 0.25] \]

\[ 0.41 [0.29, 0.52] \]

\[ 0.16 [0.10, 0.23] \]

\[ 0.30 [0.24, 0.36] \]

\[ 0.23 [0.19, 0.26] \]

\[ 0.28 [0.18, 0.38] \]

\[ 0.19 [0.13, 0.25] \]

\[ 0.08 [0.06, 0.09] \]

\[ 0.36 [0.26, 0.47] \]

\[ 0.51 [0.47, 0.55] \]

\[ 0.68 [0.57, 0.80] \]
Supplementary Figure 15: Forest plot including studies from upper middle-income countries.

| Study                        | Effect Size with 95% CI | Weight (%) |
|------------------------------|-------------------------|------------|
| Brito-Marques et al. (2020) | 0.83 [ 0.77, 0.90]       | 2.27       |
| Bunupuradah et al. (2012)   | 0.31 [ 0.22, 0.41]       | 2.18       |
| Chaiermchal et al. (2013)   | 0.51 [ 0.40, 0.62]       | 2.12       |
| Chan et al. (2012)          | 0.39 [ 0.29, 0.49]       | 2.18       |
| Chan et al. (2019)          | 0.23 [ 0.16, 0.30]       | 2.25       |
| Cruz & Ramos (2015)         | 0.28 [ 0.21, 0.35]       | 2.24       |
| Cysique et al. (2010)       | 0.43 [ 0.36, 0.50]       | 2.25       |
| Dang et al. (2015)          | 0.38 [ 0.31, 0.44]       | 2.27       |
| Day et al. (2016)           | 0.27 [ 0.22, 0.32]       | 2.30       |
| de Almeida et al. (2017)    | 0.60 [ 0.48, 0.72]       | 2.08       |
| Ding et al. (2017)          | 0.47 [ 0.41, 0.52]       | 2.29       |
| Duarte et al. (2020)        | 0.70 [ 0.62, 0.77]       | 2.24       |
| Dwyer et al. (2014)         | 0.69 [ 0.56, 0.82]       | 2.07       |
| Ene et al. (2016)           | 0.37 [ 0.30, 0.43]       | 2.26       |
| Filho & de Melo (2012)      | 0.37 [ 0.23, 0.50]       | 2.05       |
| Ganasen et al. (2008)       | 0.17 [ 0.14, 0.20]       | 2.32       |
| Gascon et al. (2018)        | 0.74 [ 0.69, 0.78]       | 2.31       |
| Goodkin et al. (2014)       | 0.43 [ 0.31, 0.55]       | 2.11       |
| Heaton et al. (2008)        | 0.35 [ 0.29, 0.42]       | 2.26       |
| Hirasuthikul et al. (2019)  | 0.59 [ 0.54, 0.65]       | 2.29       |
| Jevtovic et al. (2009)      | 0.42 [ 0.32, 0.52]       | 2.17       |
| Joska et al. (2011)         | 0.74 [ 0.67, 0.81]       | 2.26       |
| Joska et al. (2016)         | 0.18 [ 0.08, 0.28]       | 2.16       |
| Korten et al. (2021)        | 0.46 [ 0.38, 0.53]       | 2.24       |
| Lawler et al. (2010)        | 0.38 [ 0.29, 0.47]       | 2.21       |
| Lawler et al. (2011)        | 0.37 [ 0.25, 0.49]       | 2.09       |
| Mogambery et al. (2017)     | 0.53 [ 0.45, 0.61]       | 2.22       |
| Mukherjee et al. (2018)     | 0.23 [ 0.18, 0.27]       | 2.31       |
| Pinheiro et al. (2016)      | 0.54 [ 0.49, 0.59]       | 2.30       |
| Pumpradit et al. (2010)     | 0.38 [ 0.26, 0.49]       | 2.10       |
| Qiao et al. (2019)          | 0.12 [ 0.10, 0.15]       | 2.33       |
| Robbins et al. (2011)       | 0.80 [ 0.70, 0.90]       | 2.17       |
| Rodrigues et al. (2013)     | 0.52 [ 0.45, 0.60]       | 2.25       |
| Ruhanya et al. (2020)       | 0.37 [ 0.29, 0.44]       | 2.23       |
| Sereia et al. (2012)        | 0.27 [ 0.18, 0.36]       | 2.21       |
Supplementary Figure 16: Forest plot including studies from lower middle-income countries.

| Study                              | Effect Size with 95% CI | Weight (%) |
|------------------------------------|-------------------------|------------|
| Agarwal et al. (2020)              | 0.52 [0.45, 0.60]       | 2.78       |
| Akolo et al. (2014)                | 0.31 [0.23, 0.39]       | 2.78       |
| Asiedu, Kretchy & Asampong (2020) | 0.48 [0.38, 0.58]       | 2.73       |
| Atashili et al. (2013)             | 0.85 [0.82, 0.88]       | 2.86       |
| Awori et al. (2018)                | 0.69 [0.63, 0.75]       | 2.82       |
| Bharti et al. (2021)               | 0.28 [0.21, 0.34]       | 2.81       |
| Cook et al. (2014)                 | 0.36 [0.25, 0.47]       | 2.69       |
| Cook et al. (2016)                 | 0.57 [0.46, 0.68]       | 2.69       |
| Elham et al. (2020)                | 0.51 [0.40, 0.61]       | 2.72       |
| Estiasari et al. (2015)            | 0.51 [0.40, 0.62]       | 2.69       |
| Fitri, Rambe & Fitri (2018)        | 0.75 [0.66, 0.84]       | 2.74       |
| Flatt et al. (2021)                | 0.47 [0.41, 0.53]       | 2.82       |
| Gupta & Venugopal (2020)           | 0.48 [0.43, 0.53]       | 2.84       |
| Gupta et al. (2007)                | 0.61 [0.52, 0.69]       | 2.75       |
| Hestad et al. (2019)               | 0.37 [0.31, 0.42]       | 2.83       |
| Holguin et al. (2011)              | 0.22 [0.11, 0.33]       | 2.69       |
| Imam (2007)                        | 0.12 [0.08, 0.17]       | 2.84       |
| Jumare et al. (2019)               | 0.24 [0.18, 0.30]       | 2.82       |
| Kabuba et al. (2017)               | 0.35 [0.29, 0.40]       | 2.83       |
| Kalungwana et al. (2014)           | 0.50 [0.37, 0.63]       | 2.62       |
| Kamat et al. (2017)                | 0.33 [0.22, 0.44]       | 2.68       |
| Kumar et al. (2019)                | 0.21 [0.15, 0.27]       | 2.83       |
| Madan, Singh & Golecha (1997)      | 0.10 [0.06, 0.15]       | 2.84       |
| Mohamed, Oduor & Kinyanjui (2020)  | 0.81 [0.77, 0.85]       | 2.85       |
| Mugendi et al. (2019)              | 0.12 [0.09, 0.16]       | 2.86       |
Supplementary Figure 17: Forest plot including studies from low-income countries.

| Study                        | Effect Size with 95% CI | Weight (%) |
|------------------------------|-------------------------|------------|
| Njampash et al. (2008)       | 0.21 [0.16, 0.27]       | 2.83       |
| Nyamayaro et al. (2020)      | 0.50 [0.42, 0.58]       | 2.78       |
| Odias, Ogunrin & Ogunniyi (2006) | 0.66 [0.59, 0.72]     | 2.81       |
| Oshainike et al. (2012)      | 0.03 [0.01, 0.05]       | 2.87       |
| Saini & Barar (2016)         | 0.32 [0.22, 0.43]       | 2.71       |
| Salawu et al. (2008)         | 0.57 [0.44, 0.69]       | 2.64       |
| Sanmari et al. (2020)        | 0.19 [0.14, 0.24]       | 2.84       |
| Tilghman et al. (2014)       | 0.36 [0.29, 0.44]       | 2.79       |
| Widyadharma et al. (2017)    | 0.33 [0.24, 0.43]       | 2.74       |
| Yakasai et al. (2015)        | 0.76 [0.67, 0.86]       | 2.74       |
| Yusuf et al. (2017)          | 0.22 [0.18, 0.25]       | 2.85       |

Overall

Heterogeneity: $\tau^2 = 0.04$, $I^2 = 98.07\%$, $H^2 = 51.72$

Test of $\theta_i = \theta_j$: $Q(35) = 3071.91$, $p = 0.00$

Test of $\theta = 0$: $z = 11.54$, $p = 0.00$

Random-effects REML model
Supplementary Figure 18: Forest plot including studies from mixed or unclassified countries.

| Study                                      | Effect Size with 95% CI | Weight (%) |
|--------------------------------------------|-------------------------|------------|
| Grund et al. (2013)                        | 0.14 [ 0.09, 0.18]      | 10.04      |
| Haddow et al. (2018)                       | 0.26 [ 0.22, 0.30]      | 10.05      |
| Joska et al. (2019)                        | 0.76 [ 0.70, 0.83]      | 9.88       |
| Jumare et al. (2020)                       | 0.28 [ 0.25, 0.31]      | 10.09      |
| Maj et al. (1994)                          | 0.13 [ 0.10, 0.16]      | 10.11      |
| Milanini et al. (2017)                     | 0.38 [ 0.36, 0.40]      | 10.13      |
| Robertson et al. (2014)                    | 0.45 [ 0.42, 0.48]      | 10.08      |
| Tremont-Lukats, Teixeira & Hernandez (1999)| 0.36 [ 0.25, 0.47]      | 9.40       |
| Wright et al. (2008)                       | 0.12 [ 0.09, 0.14]      | 10.12      |
| Wright et al. (2015)                       | 0.20 [ 0.17, 0.23]      | 10.09      |
| **Overall**                                | **0.31 [ 0.18, 0.43]**  |            |

Heterogeneity: $\tau^2 = 0.04$, $I^2 = 99.29\%$, $H^2 = 140.56$

Test of $\theta = \theta^*$; $Q(9) = 783.68$, $p = 0.00$

Test of $\theta = 0$: $z = 4.92$, $p = 0.00$

Random-effects REML model

Supplementary Figure 19: Forest plot of study subgroups by study exclusion criteria. Figure made using STATA.

| Exclusion Criteria | Effect Size with 95% CI | Weight (%) |
|--------------------|-------------------------|------------|
| yes                | 0.40 [ 0.36, 0.44]      | 34.57      |
| partial            | 0.43 [ 0.38, 0.47]      | 34.88      |
| no                 | 0.33 [ 0.27, 0.38]      | 13.59      |
| unspecified        | 0.38 [ 0.32, 0.45]      | 16.95      |
| **Overall (225 studies)** |                      |            |

Heterogeneity: $\tau^2 = 0.04$, $I^2 = 98.16\%$, $H^2 = 54.26$

Test of $\theta = \theta^*$; $Q(224) = 13833.19$, $p = 0.00$

Test of group differences: $Q(3) = 7.39$, $p = 0.06$

Random-effects REML model
| Study                                           | Effect Size with 95% CI | Weight (%) |
|------------------------------------------------|-------------------------|------------|
| Agarwal et al. (2020)                          | 0.52 [0.45, 0.60]       | 1.28       |
| Akolo et al. (2014)                            | 0.31 [0.23, 0.39]       | 1.28       |
| Alford et al. (2019)                           | 0.31 [0.18, 0.44]       | 1.19       |
| Arentoft et al. (2015)                         | 0.68 [0.60, 0.76]       | 1.28       |
| Bai et al. (2017)                              | 0.32 [0.25, 0.40]       | 1.29       |
| Banerjee, McIntosh & Ironson (2019)            | 0.15 [0.10, 0.20]       | 1.32       |
| Barber et al. (2017)                           | 0.22 [0.15, 0.28]       | 1.30       |
| Belete, Medfu & Yemiyamrew (2017)              | 0.33 [0.27, 0.39]       | 1.31       |
| Boccellari et al. (1993)                       | 0.22 [0.11, 0.33]       | 1.22       |
| Braganca & Palha (2011)                        | 0.51 [0.42, 0.60]       | 1.27       |
| Brito-Marques et al. (2020)                    | 0.83 [0.77, 0.90]       | 1.30       |
| Brouillette et al. (2015)                      | 0.33 [0.26, 0.40]       | 1.30       |
| Brouillette et al. (2021)                      | 0.52 [0.46, 0.59]       | 1.31       |
| Chalermchai et al. (2013)                      | 0.51 [0.40, 0.62]       | 1.21       |
| Chang et al. (2011)                            | 0.42 [0.30, 0.54]       | 1.21       |
| Ciccarelli et al. (2013)                       | 0.50 [0.40, 0.59]       | 1.25       |
| Ciccarelli et al. (2019)                       | 0.47 [0.39, 0.55]       | 1.28       |
| Dang et al. (2015)                             | 0.38 [0.31, 0.44]       | 1.30       |
| Davies et al. (2019)                           | 0.28 [0.18, 0.38]       | 1.24       |
| Donne et al. (2020)                            | 0.07 [0.02, 0.12]       | 1.31       |
| Dufour et al. (2013)                           | 0.22 [0.18, 0.27]       | 1.32       |
| Ene et al. (2016)                              | 0.37 [0.30, 0.43]       | 1.30       |
| Failde-Garrido et al. (2008)                   | 0.52 [0.42, 0.63]       | 1.23       |
| Gascon et al. (2018)                           | 0.74 [0.69, 0.78]       | 1.33       |
| Grima et al. (2012)                            | 0.47 [0.38, 0.56]       | 1.26       |
| Groff et al. (2020)                            | 0.38 [0.27, 0.49]       | 1.23       |
| Gupta & Venugopal (2020)                       | 0.48 [0.43, 0.53]       | 1.32       |
| Hanna et al. (2020)                            | 0.37 [0.28, 0.46]       | 1.26       |
| Heaton et al. (2008)                           | 0.35 [0.29, 0.42]       | 1.30       |
| Janssen et al. (1989)                          | 0.41 [0.31, 0.51]       | 1.24       |
| Janssen et al. (2015)                          | 0.20 [0.12, 0.28]       | 1.28       |
| Jumare et al. (2019)                           | 0.24 [0.18, 0.30]       | 1.31       |
| Kallianpur et al. (2016)                       | 0.36 [0.34, 0.39]       | 1.34       |
| Kamal et al. (2017)                            | 0.27 [0.16, 0.38]       | 1.21       |
| Kim et al. (2016)                              | 0.26 [0.20, 0.32]       | 1.30       |
| Kinai et al. (2017)                            | 0.25 [0.22, 0.28]       | 1.33       |
| Ku et al. (2014)                               | 0.26 [0.20, 0.32]       | 1.30       |
| Lawler et al. (2010)                           | 0.38 [0.29, 0.47]       | 1.27       |
| Lawler et al. (2011)                           | 0.37 [0.25, 0.49]       | 1.20       |
| Lu et al. (2014)                               | 0.49 [0.36, 0.62]       | 1.17       |
| Marin-Webb et al. (2016)                       | 0.43 [0.39, 0.47]       | 1.32       |
| Matchanova et al. (2020)                       | 0.60 [0.52, 0.68]       | 1.28       |
| McNamara et al. (2017)                         | 0.51 [0.48, 0.55]       | 1.33       |
Random-effects REML model

Heterogeneity: $\tau^2 = 0.03$, $I^2 = 97.43\%$, $H^2 = 38.98$

Test of $\theta = \theta$: $Q(77) = 3969.47$, $p = 0.00$

Test of $\theta = 0$: $z = 19.62$, $p = 0.00$

| Study                          | Effect Size (95% CI) |
|--------------------------------|----------------------|
| Metral et al. (2020)           | 0.27 [0.24, 0.30]    |
| Milanini et al. (2020)         | 0.53 [0.41, 0.64]    |
| Mohamed, Oduor & Kinyanjui (2020) | 0.81 [0.77, 0.85] |
| Mugendi et al. (2019)          | 0.12 [0.09, 0.16]    |
| Munoz-Moreno et al. (2010)     | 0.42 [0.32, 0.53]    |
| Namagga et al. (2019)          | 0.58 [0.53, 0.63]    |
| Nichols et al. (2013)          | 0.65 [0.58, 0.71]    |
| Njamnshi et al. (2008)         | 0.21 [0.16, 0.27]    |
| Odiase, Ogunrin & Ogunniyi (2006) | 0.66 [0.59, 0.72] |
| Oshinaike et al. (2012)        | 0.03 [0.01, 0.05]    |
| Overton et al. (2013)          | 0.51 [0.44, 0.58]    |
| Perez-Valero et al. (2013)     | 0.27 [0.21, 0.34]    |
| Pinheiro et al. (2016)         | 0.54 [0.49, 0.59]    |
| Portilla et al. (2019)         | 0.30 [0.20, 0.40]    |
| Rodrigues et al. (2013)        | 0.52 [0.45, 0.60]    |
| Sacktor et al. (2014)          | 0.33 [0.28, 0.38]    |
| Sacktor et al. (2016)          | 0.92 [0.87, 0.97]    |
| Sanmarti et al. (2020)         | 0.19 [0.14, 0.24]    |
| Sheppard et al. (2015)         | 0.16 [0.08, 0.24]    |
| Su et al. (2016)               | 0.17 [0.10, 0.24]    |
| Suarez et al. (2001)           | 0.58 [0.48, 0.68]    |
| Sundermann et al. (2018)       | 0.43 [0.40, 0.45]    |
| Tilghman et al. (2014)         | 0.36 [0.29, 0.44]    |
| Tozzi et al. (2005)            | 0.54 [0.50, 0.59]    |
| Trufio et al. (2018)           | 0.22 [0.18, 0.25]    |
| Valcour et al. (2013)          | 0.46 [0.33, 0.58]    |
| Vergori et al. (2019)          | 0.23 [0.19, 0.26]    |
| Villa et al. (1996)            | 0.28 [0.18, 0.38]    |
| Widyadhharma et al. (2017)     | 0.33 [0.24, 0.43]    |
| Wilkins et al. (1991)          | 0.36 [0.26, 0.47]    |
| Yakasai et al. (2015)          | 0.76 [0.67, 0.86]    |
| Yideg et al. (2019)            | 0.36 [0.31, 0.41]    |
| Zaegel-Faucher et al. (2020)   | 0.57 [0.48, 0.66]    |
| Zhang et al. (2012)            | 0.37 [0.29, 0.45]    |
| Zhao et al. (2015)             | 0.37 [0.31, 0.44]    |

Overall

Heterogeneity: $\tau^2 = 0.03$, $I^2 = 97.43\%$, $H^2 = 38.98$

Test of $\theta = \theta$: $Q(77) = 3969.47$, $p = 0.00$

Test of $\theta = 0$: $z = 19.62$, $p = 0.00$
Supplementary Figure 21: Forest plot including studies with partial criteria.

| Study                                      | Effect Size with 95% CI | Weight (%) |
|--------------------------------------------|-------------------------|------------|
| Akena et al. (2010)                       | 0.70 [ 0.59, 0.81]      | 1.22       |
| Animut et al. (2019)                      | 0.67 [ 0.64, 0.71]      | 1.31       |
| Asiedu, Kretchy & Asampong (2020)         | 0.48 [ 0.38, 0.58]      | 1.24       |
| Aung et al. (2021)                        | 0.42 [ 0.36, 0.48]      | 1.29       |
| Awori et al. (2018)                       | 0.69 [ 0.63, 0.75]      | 1.29       |
| Bornstein et al. (1993)                   | 0.13 [ 0.08, 0.17]      | 1.31       |
| Bunupuradah et al. (2012)                 | 0.31 [ 0.22, 0.41]      | 1.25       |
| Casado et al. (2014)                      | 0.13 [ 0.09, 0.17]      | 1.30       |
| Chan et al. (2012)                        | 0.39 [ 0.29, 0.49]      | 1.24       |
| Chan et al. (2019)                        | 0.23 [ 0.16, 0.30]      | 1.28       |
| Ciccarelli et al. (2011)                  | 0.12 [ 0.09, 0.15]      | 1.31       |
| Cook et al. (2014)                        | 0.36 [ 0.25, 0.47]      | 1.22       |
| Cook et al. (2016)                        | 0.57 [ 0.46, 0.68]      | 1.22       |
| Crum-Cianflone et al. (2013)              | 0.19 [ 0.14, 0.24]      | 1.30       |
| Dampier et al. (2017)                     | 0.59 [ 0.50, 0.68]      | 1.25       |
| de Almeida et al. (2017)                  | 0.60 [ 0.48, 0.72]      | 1.20       |
| de Ronchi, Faranca & Berardi (2002)       | 0.20 [ 0.14, 0.26]      | 1.29       |
| Elham et al. (2020)                       | 0.51 [ 0.40, 0.61]      | 1.24       |
| Estiasari et al. (2015)                   | 0.51 [ 0.40, 0.62]      | 1.22       |
| Fabbiani et al. (2017)                    | 0.13 [ 0.04, 0.22]      | 1.25       |
| Fabbiani et al. (2018)                    | 0.24 [ 0.17, 0.31]      | 1.28       |
| Fabbiani et al. (2019)                    | 0.16 [ 0.12, 0.21]      | 1.30       |
| Fazeli, Woods & Vance (2019)              | 0.53 [ 0.46, 0.60]      | 1.27       |
| Ferrando et al. (2003)                    | 0.62 [ 0.54, 0.70]      | 1.27       |
| Fialho et al. (2013)                      | 0.57 [ 0.48, 0.67]      | 1.24       |
| Filho & de Melo (2012)                    | 0.37 [ 0.23, 0.50]      | 1.18       |
| Fitri, Rambe & Fitri (2018)               | 0.75 [ 0.66, 0.84]      | 1.25       |
| Foca et al. (2016)                        | 0.47 [ 0.40, 0.54]      | 1.28       |
| Foley et al. (2013)                       | 0.22 [ 0.12, 0.31]      | 1.25       |
| Gandhi et al. (2011)                      | 0.86 [ 0.80, 0.92]      | 1.29       |
| Garvey, Surendrakumar & Winston (2011)    | 0.19 [ 0.11, 0.27]      | 1.27       |
| Gomez et al. (2019)                       | 0.21 [ 0.17, 0.25]      | 1.31       |
| Gott et al. (2017)                        | 0.55 [ 0.45, 0.65]      | 1.24       |
| Gupta et al. (2007)                       | 0.61 [ 0.52, 0.69]      | 1.26       |
| Hestad et al. (2019)                      | 0.37 [ 0.31, 0.42]      | 1.29       |
| Holguin et al. (2011)                     | 0.22 [ 0.11, 0.33]      | 1.22       |
| Imai et al. (2020)                        | 0.26 [ 0.22, 0.30]      | 1.31       |
| Joska et al. (2019)                       | 0.76 [ 0.70, 0.83]      | 1.29       |
| Kabuba et al. (2017)                      | 0.35 [ 0.29, 0.40]      | 1.29       |
| Kalayjian et al. (2014)                   | 0.23 [ 0.17, 0.28]      | 1.30       |
| Kammenga et al. (2017)                    | 0.47 [ 0.34, 0.60]      | 1.18       |
| Karlsen, Froland & Reinvang (1994)        | 0.19 [ 0.08, 0.30]      | 1.23       |
| Kelly et al. (2014)                       | 0.70 [ 0.61, 0.79]      | 1.26       |
| Study                                      | Effect Size | Weight | Proportion Cognitively Impaired |
|-------------------------------------------|-------------|--------|---------------------------------|
| Kemp et al. (2021)                        | 0.41        | 0.33   | 0.49                            |
| Klusman et al. (1991)                     | 0.38        | 0.29   | 0.47                            |
| Korten et al. (2021)                      | 0.46        | 0.38   | 0.53                            |
| Kupprat et al. (2017)                     | 0.24        | 0.17   | 0.30                            |
| Makinson et al. (2020)                    | 0.35        | 0.29   | 0.42                            |
| Mogambery et al. (2017)                   | 0.53        | 0.45   | 0.61                            |
| Molinaro et al. (2020)                    | 0.59        | 0.54   | 0.64                            |
| Munoz-Moreno et al. (2013)                | 0.61        | 0.49   | 0.73                            |
| Nyamayaro et al. (2020)                   | 0.50        | 0.42   | 0.58                            |
| Patel et al. (2010)                       | 0.14        | 0.09   | 0.19                            |
| Pereda et al. (2000)                      | 0.27        | 0.18   | 0.36                            |
| Pumpradit et al. (2010)                   | 0.38        | 0.26   | 0.49                            |
| Robbins et al. (2011)                     | 0.80        | 0.70   | 0.90                            |
| Robertson et al. (2014)                   | 0.45        | 0.42   | 0.48                            |
| Robertson et al. (2019)                   | 0.41        | 0.40   | 0.43                            |
| Saini & Barar (2016)                      | 0.32        | 0.22   | 0.43                            |
| Salahuddin et al. (2020)                  | 0.39        | 0.33   | 0.45                            |
| Salawu et al. (2008)                      | 0.57        | 0.44   | 0.69                            |
| Sevigny et al. (2007)                     | 0.69        | 0.63   | 0.74                            |
| Simioni et al. (2010)                     | 0.84        | 0.79   | 0.89                            |
| Spector et al. (2010)                     | 0.37        | 0.30   | 0.43                            |
| Starace et al. (2002)                     | 0.18        | 0.14   | 0.22                            |
| Thyagarajan et al. (2010)                 | 0.18        | 0.09   | 0.27                            |
| Tomita et al. (2019)                      | 0.44        | 0.36   | 0.51                            |
| Tremont-Lukats, Teixeira & Hernandez (1999)| 0.36      | 0.25   | 0.47                            |
| Troncoso & de Oliveira Contero (2015)     | 0.52        | 0.43   | 0.61                            |
| Tsegaw et al. (2017)                      | 0.36        | 0.33   | 0.40                            |
| Valcour et al. (2004)                     | 0.20        | 0.14   | 0.25                            |
| van den Dries et al. (2017)               | 0.41        | 0.29   | 0.52                            |
| Vassallo et al. (2015)                    | 0.30        | 0.24   | 0.36                            |
| Vitiello et al. (2007)                    | 0.19        | 0.13   | 0.25                            |
| Wang et al. (2013)                        | 0.48        | 0.43   | 0.54                            |
| Wojna et al. (2007)                       | 0.68        | 0.57   | 0.80                            |
| Xiao et al. (2020)                        | 0.87        | 0.83   | 0.91                            |
| Yechoor et al. (2016)                     | 0.38        | 0.31   | 0.45                            |
| Zamudio-Rodiguez et al. (2018)            | 0.66        | 0.60   | 0.72                            |

**Overall**

Heterogeneity: $t^2 = 0.04$, $I^2 = 97.62\%$, $H^2 = 42.05$

Test of $θ = 0$: $Q(78) = 3619.12$, $p = 0.00$

Test of $θ = 0$: $z = 18.86$, $p = 0.00$

Random-effects REML model
Supplementary Figure 22: Forest plot including studies without exclusion criteria.

| Study                                | Effect Size with 95% CI | Weight (%) |
|--------------------------------------|-------------------------|------------|
| Araya et al. (2020)                  | 0.36 [0.32, 0.39]       | 3.39       |
| Becker et al. (2004)                 | 0.20 [0.16, 0.25]       | 3.37       |
| Bloch et al. (2016)                  | 0.31 [0.25, 0.36]       | 3.33       |
| Bryant et al. (2015)                 | 0.58 [0.49, 0.67]       | 3.18       |
| Carvalhal et al. (2016)              | 0.60 [0.55, 0.65]       | 3.37       |
| Cross et al. (2013)                  | 0.41 [0.37, 0.45]       | 3.38       |
| Darling et al. (2021)                | 0.40 [0.37, 0.43]       | 3.41       |
| Day et al. (2016)                    | 0.27 [0.22, 0.32]       | 3.36       |
| Deiss et al. (2019)                  | 0.19 [0.13, 0.24]       | 3.34       |
| Flatt et al. (2021)                  | 0.47 [0.41, 0.53]       | 3.31       |
| Greene et al. (2015)                 | 0.47 [0.39, 0.54]       | 3.23       |
| Haddow et al. (2018)                 | 0.26 [0.22, 0.30]       | 3.39       |
| Halman et al. (2014)                 | 0.48 [0.37, 0.59]       | 3.07       |
| Imam (2007)                          | 0.12 [0.08, 0.17]       | 3.37       |
| Invernizzi et al. (2018)             | 0.49 [0.37, 0.61]       | 3.00       |
| McCutchan et al. (2007)              | 0.27 [0.22, 0.32]       | 3.35       |
| Mukherjee et al. (2018)              | 0.23 [0.18, 0.27]       | 3.37       |
| Munoz-Moreno et al. (2008)           | 0.48 [0.38, 0.58]       | 3.14       |
| Nakku, Kinyada & Hoskins (2013)      | 0.64 [0.61, 0.68]       | 3.39       |
| Naveed et al. (2021)                 | 0.39 [0.36, 0.42]       | 3.41       |
| Qiao et al. (2019)                   | 0.12 [0.10, 0.15]       | 3.42       |
| Sereia et al. (2012)                 | 0.27 [0.18, 0.36]       | 3.19       |
| Tamargo et al. (2021)                | 0.15 [0.11, 0.18]       | 3.40       |
| Underwood et al. (2019)              | 0.21 [0.18, 0.25]       | 3.41       |
| Wang et al. (2019)                   | 0.08 [0.06, 0.09]       | 3.44       |
| Winston et al. (2013)                | 0.51 [0.47, 0.55]       | 3.38       |
| Wright et al. (2008)                 | 0.12 [0.09, 0.14]       | 3.42       |
| Wright et al. (2015)                 | 0.20 [0.17, 0.23]       | 3.41       |
| Wubetu, Asefa & Gebregiorgis (2021)  | 0.41 [0.36, 0.46]       | 3.37       |
| Yusuf et al. (2017)                  | 0.22 [0.18, 0.25]       | 3.39       |
| **Overall**                          | **0.33 [0.27, 0.38]**   |            |

Heterogeneity: $\tau^2 = 0.02$, $I^2 = 98.51\%$, $H^2 = 66.98$

Test of $\theta_i = \theta_j$: $Q(29) = 2221.86$, $p = 0.00$

Test of $\theta = 0$: $z = 11.23$, $p = 0.00$

Random-effects REML model
Supplementary Figure 23: Forest plot including studies with unspecified exclusion criteria.

| Study                              | Effect Size with 95% CI | Weight (%) |
|------------------------------------|-------------------------|------------|
| Arenas-Pinto et al. (2014)         | 0.52 [0.48, 0.56]       | 2.68       |
| Atashili et al. (2013)             | 0.85 [0.82, 0.88]       | 2.69       |
| Atkins et al. (2010)               | 0.49 [0.43, 0.54]       | 2.67       |
| Bharti et al. (2021)               | 0.28 [0.21, 0.34]       | 2.64       |
| Bourgeois et al. (2020)            | 0.34 [0.29, 0.39]       | 2.67       |
| Chan et al. (2021)                 | 0.30 [0.19, 0.41]       | 2.52       |
| Cruz & Ramos (2015)                | 0.28 [0.21, 0.35]       | 2.62       |
| Cysique et al. (2010)              | 0.43 [0.36, 0.50]       | 2.63       |
| Derry et al. (2020)                | 0.35 [0.28, 0.42]       | 2.62       |
| Ding et al. (2017)                 | 0.47 [0.41, 0.52]       | 2.67       |
| Duarte et al. (2020)               | 0.70 [0.62, 0.77]       | 2.62       |
| Dufouil et al. (2015)              | 0.58 [0.54, 0.63]       | 2.67       |
| Dwyer et al. (2014)                | 0.69 [0.56, 0.82]       | 2.46       |
| Erlandson et al. (2019)            | 0.17 [0.15, 0.19]       | 2.70       |
| Ganaseen et al. (2008)             | 0.17 [0.14, 0.20]       | 2.69       |
| Gibbie et al. (2006)               | 0.07 [0.03, 0.11]       | 2.68       |
| Goodkin et al. (2014)              | 0.43 [0.31, 0.55]       | 2.50       |
| Grauer et al. (2015)               | 0.87 [0.80, 0.94]       | 2.63       |
| Grund et al. (2013)                | 0.14 [0.09, 0.18]       | 2.68       |
| Hiransuthikul et al. (2019)        | 0.59 [0.54, 0.65]       | 2.67       |
| Jevtovic et al. (2009)             | 0.42 [0.32, 0.52]       | 2.56       |
| Joska et al. (2011)                | 0.74 [0.67, 0.81]       | 2.63       |
| Joska et al. (2016)                | 0.18 [0.08, 0.28]       | 2.55       |
| Jumare et al. (2020)               | 0.28 [0.25, 0.31]       | 2.69       |
| Kalayjian et al. (2019)            | 0.24 [0.22, 0.26]       | 2.71       |
| Kalungwana et al. (2014)           | 0.50 [0.37, 0.63]       | 2.46       |
| Kamat et al. (2017)                | 0.33 [0.22, 0.44]       | 2.52       |
| Kumar et al. (2019)                | 0.21 [0.15, 0.27]       | 2.66       |
| Libertone et al. (2014)            | 0.32 [0.28, 0.36]       | 2.69       |
| Madan, Singh & Golechha (1997)     | 0.10 [0.06, 0.15]       | 2.68       |
| Maj et al. (1994)                  | 0.13 [0.10, 0.16]       | 2.70       |
| Mayeux et al. (1993)               | 0.44 [0.35, 0.53]       | 2.57       |
| Milanini et al. (2017)             | 0.38 [0.36, 0.40]       | 2.71       |
| Moore et al. (2012)                | 0.19 [0.14, 0.24]       | 2.66       |
| Ruhanya et al. (2020)              | 0.37 [0.29, 0.44]       | 2.61       |
| Stern et al. (1991)                | 0.58 [0.49, 0.67]       | 2.59       |
| Temereanca et al. (2020)           | 0.35 [0.29, 0.41]       | 2.64       |
| van Gorp et al. (1999)             | 0.16 [0.10, 0.23]       | 2.65       |

**Overall**

Heterogeneity: $\tau^2 = 0.04$, $I^2 = 98.76\%$, $H^2 = 80.77$

Test of $\theta = \theta_0$: $Q(37) = 2728.22$, $p = 0.00$

Test of $\theta = 0$: $z = 11.39$, $p = 0.00$

Random-effects REML model
Supplementary Figure 24: Forest plot of study subgroups by NOS score (study quality). Figure made using STATA.

| NOS Score (study quality) | Effect Size with 95% CI | Weight (%) |
|---------------------------|-------------------------|------------|
| score = 6                 | 0.38 [0.32, 0.43]        | 21.47      |
| score = 7                 | 0.37 [0.33, 0.42]        | 36.27      |
| score = 8                 | 0.43 [0.39, 0.46]        | 42.25      |

**Overall (225 studies)**

Heterogeneity: $t^2 = 0.04$, $I^2 = 98.16\%$, $H^2 = 54.26$

Test of $\theta = 0$; $Q(224) = 13833.19$, $p = 0.00$

Test of group differences: $Q_1(3) = 7.39$, $p = 0.06$

Random-effects REML model

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Supplementary Figure 25: Forest plot including studies with NOS scores = 6.

| Study                                | Effect Size with 95% CI | Weight (%) |
|--------------------------------------|-------------------------|------------|
| Akena et al. (2010)                  | 0.70 [0.59, 0.81]        | 1.97       |
| Alford et al. (2019)                 | 0.31 [0.18, 0.44]        | 1.93       |
| Barber et al. (2017)                 | 0.22 [0.15, 0.28]        | 2.09       |
| Bryant et al. (2015)                 | 0.58 [0.49, 0.67]        | 2.04       |
| Chan et al. (2021)                   | 0.30 [0.19, 0.41]        | 1.98       |
| Chang et al. (2011)                  | 0.42 [0.30, 0.54]        | 1.96       |
| Cross et al. (2013)                  | 0.41 [0.37, 0.45]        | 2.13       |
| Crum-Cianflone et al. (2013)         | 0.19 [0.14, 0.24]        | 2.11       |
| Cruz & Ramos (2015)                  | 0.28 [0.21, 0.35]        | 2.07       |
| Dang et al. (2015)                   | 0.38 [0.31, 0.44]        | 2.09       |
| Davies et al. (2019)                 | 0.28 [0.18, 0.38]        | 2.01       |
| Derry et al. (2020)                  | 0.35 [0.28, 0.42]        | 2.07       |
| Duarte et al. (2020)                 | 0.70 [0.62, 0.77]        | 2.07       |
| Dwyer et al. (2014)                  | 0.69 [0.56, 0.82]        | 1.93       |
| Erlandson et al. (2019)              | 0.17 [0.15, 0.19]        | 2.15       |
| Fabbiani et al. (2017)               | 0.13 [0.04, 0.22]        | 2.03       |
| Ferrando et al. (2003)               | 0.62 [0.54, 0.70]        | 2.06       |
| Fitri, Rambe & Fitri (2018)          | 0.75 [0.66, 0.84]        | 2.03       |
| Ganasen et al. (2008)                | 0.17 [0.14, 0.20]        | 2.14       |
| Gibbie et al. (2006)                 | 0.07 [0.03, 0.11]        | 2.12       |
| Goodkin et al. (2014)                | 0.43 [0.31, 0.55]        | 1.96       |
| Groff et al. (2020)                  | 0.38 [0.27, 0.49]        | 1.98       |
| Gupta et al. (2007)                  | 0.61 [0.52, 0.69]        | 2.04       |
| Hanna et al. (2020)                  | 0.37 [0.28, 0.46]        | 2.03       |
| Hiransuthikul et al. (2019)          | 0.59 [0.54, 0.65]        | 2.11       |
| Invernizzi et al. (2018)             | 0.49 [0.37, 0.61]        | 1.95       |
| Janssen et al. (2015)                | 0.20 [0.12, 0.28]        | 2.06       |
| Jevtovic et al. (2009)               | 0.42 [0.32, 0.52]        | 2.01       |
| Joska et al. (2016)                  | 0.18 [0.08, 0.28]        | 2.00       |
Supplementary Figure 26: Forest plot including studies with NOS scores = 7.

| Study                                      | Effect Size   | Weight (%) |
|--------------------------------------------|---------------|------------|
| Agarwal et al. (2020)                      | 0.52 [0.45, 0.60] | 1.22       |
| Araya et al. (2020)                        | 0.36 [0.32, 0.39] | 1.26       |
| Arentoft et al. (2015)                     | 0.68 [0.60, 0.76] | 1.22       |
| Asiedu, Kretchy & Asampong (2020)          | 0.48 [0.38, 0.58] | 1.20       |
| Atashili et al. (2013)                     | 0.85 [0.82, 0.88] | 1.26       |
| Boccellari et al. (1993)                   | 0.22 [0.11, 0.33] | 1.17       |
| Bornstein et al. (1993)                    | 0.13 [0.08, 0.17] | 1.26       |
| Braganca & Palha (2011)                    | 0.51 [0.42, 0.60] | 1.21       |
| Brito-Marques et al. (2020)                | 0.83 [0.77, 0.90] | 1.24       |
| Bunupuradah et al. (2012)                  | 0.31 [0.22, 0.41] | 1.20       |
| Casado et al. (2014)                       | 0.13 [0.09, 0.17] | 1.26       |
| Chan et al. (2012)                         | 0.39 [0.29, 0.49] | 1.19       |
| Chan et al. (2019)                         | 0.23 [0.16, 0.30] | 1.23       |
| Ciccarelli et al. (2013)                   | 0.50 [0.40, 0.59] | 1.19       |
| Ciccarelli et al. (2019)                   | 0.47 [0.39, 0.55] | 1.22       |
| Study                                      | Effect Size | Weight | No. of Studies | % Cognitively Impaired |
|-------------------------------------------|-------------|--------|----------------|------------------------|
| Cook et al. (2014)                        | 0.36        | 1.20   | 1              | 0.25, 0.47             |
| Cook et al. (2016)                        | 0.57        | 1.27   | 1              | 0.46, 0.68             |
| de Ronchi, Faranca & Berardi (2002)       | 0.20        | 1.16   | 1              | 0.14, 0.26             |
| Deiss et al. (2019)                       | 0.19        | 1.23   | 1              | 0.13, 0.24             |
| Ding et al. (2017)                        | 0.47        | 1.25   | 1              | 0.41, 0.52             |
| Donne et al. (2020)                       | 0.07        | 1.25   | 1              | 0.02, 0.12             |
| Estiasari et al. (2015)                   | 0.51        | 1.18   | 1              | 0.40, 0.62             |
| Fabbiani et al. (2018)                    | 0.24        | 1.23   | 1              | 0.17, 0.31             |
| Fabbiani et al. (2019)                    | 0.16        | 1.26   | 1              | 0.12, 0.21             |
| Falde-Garrido et al. (2008)               | 0.52        | 1.18   | 1              | 0.42, 0.63             |
| Fialho et al. (2013)                      | 0.57        | 1.20   | 1              | 0.48, 0.67             |
| Filho & de Melo (2012)                    | 0.37        | 1.14   | 1              | 0.23, 0.50             |
| Foley et al. (2013)                       | 0.22        | 1.20   | 1              | 0.12, 0.31             |
| Gandhi et al. (2011)                      | 0.86        | 1.24   | 1              | 0.80, 0.92             |
| Garvey, Surendrakumar & Winston (2011)    | 0.19        | 1.22   | 1              | 0.11, 0.27             |
| Gascon et al. (2018)                      | 0.74        | 1.26   | 1              | 0.69, 0.78             |
| Grauer et al. (2015)                      | 0.87        | 1.26   | 1              | 0.80, 0.94             |
| Greene et al. (2015)                      | 0.47        | 1.23   | 1              | 0.39, 0.54             |
| Grima et al. (2012)                       | 0.47        | 1.20   | 1              | 0.38, 0.56             |
| Grund et al. (2013)                       | 0.14        | 1.26   | 1              | 0.09, 0.18             |
| Gupta & Venugopal (2020)                  | 0.48        | 1.25   | 1              | 0.43, 0.53             |
| Halman et al. (2014)                      | 0.48        | 1.18   | 1              | 0.37, 0.59             |
| Holguin et al. (2011)                     | 0.22        | 1.17   | 1              | 0.11, 0.33             |
| Imam (2007)                               | 0.12        | 1.26   | 1              | 0.08, 0.17             |
| Janssen et al. (1989)                     | 0.41        | 1.19   | 1              | 0.31, 0.51             |
| Jumare et al. (2019)                      | 0.24        | 1.24   | 1              | 0.18, 0.30             |
| Kalayjian et al. (2014)                   | 0.23        | 1.25   | 1              | 0.17, 0.28             |
| Kalayjian et al. (2019)                   | 0.24        | 1.27   | 1              | 0.22, 0.26             |
| Kamal et al. (2017)                       | 0.27        | 1.17   | 1              | 0.16, 0.38             |
| Kamat et al. (2017)                       | 0.33        | 1.17   | 1              | 0.22, 0.44             |
| Kim et al. (2016)                         | 0.26        | 1.24   | 1              | 0.20, 0.32             |
| Kupprat et al. (2017)                     | 0.24        | 1.24   | 1              | 0.17, 0.30             |
| Lawler et al. (2010)                      | 0.38        | 1.21   | 1              | 0.29, 0.47             |
| Lawler et al. (2011)                      | 0.37        | 1.15   | 1              | 0.25, 0.49             |
| Lu et al. (2014)                          | 0.49        | 1.13   | 1              | 0.36, 0.62             |
| Marin-Webb et al. (2016)                  | 0.43        | 1.26   | 1              | 0.39, 0.47             |
| McCutchan et al. (2007)                   | 0.27        | 1.25   | 1              | 0.22, 0.32             |
| Metral et al. (2020)                      | 0.27        | 1.27   | 1              | 0.24, 0.30             |
| Mogambry et al. (2017)                    | 0.53        | 1.22   | 1              | 0.45, 0.61             |
| Moore et al. (2012)                       | 0.19        | 1.25   | 1              | 0.14, 0.24             |
| Mukherjee et al. (2018)                   | 0.23        | 1.26   | 1              | 0.18, 0.27             |
| Munoz-Moreno et al. (2008)                | 0.48        | 1.20   | 1              | 0.38, 0.58             |
| Munoz-Moreno et al. (2010)                | 0.42        | 1.18   | 1              | 0.32, 0.53             |
| Nakku, Kinyada & Hoskins (2013)           | 0.64        | 1.26   | 1              | 0.61, 0.68             |
| Naveed et al. (2021)                      | 0.39        | 1.26   | 1              | 0.36, 0.42             |
| Njamnshi et al. (2008)                    | 0.21        | 1.25   | 1              | 0.16, 0.27             |
| Pereda et al. (2000)                      | 0.27        | 1.21   | 1              | 0.18, 0.36             |
Supplementary Figure 27: Forest plot including studies with NOS scores = 8.

| Study                        | Effect Size with 95% CI | Weight (%) |
|------------------------------|-------------------------|------------|
| Akolo et al. (2014)          | 0.31 [ 0.23, 0.39]      | 1.05       |
| Animut et al. (2019)         | 0.67 [ 0.64, 0.71]      | 1.09       |
| Arenas-Pinto et al. (2014)   | 0.52 [ 0.48, 0.56]      | 1.08       |
| Atkins et al. (2010)         | 0.49 [ 0.43, 0.54]      | 1.07       |
| Aung et al. (2021)           | 0.42 [ 0.36, 0.48]      | 1.07       |
| Awori et al. (2018)          | 0.69 [ 0.63, 0.75]      | 1.06       |
| Bai et al. (2017)            | 0.32 [ 0.25, 0.40]      | 1.05       |
| Banerjee, McIntosh & Ironson (2019) | 0.15 [ 0.10, 0.20]  | 1.08       |
| Becker et al. (2004)         | 0.20 [ 0.16, 0.25]      | 1.08       |
| Belete, Medfu & Yemiyamrow (2017) | 0.33 [ 0.27, 0.39]  | 1.07       |
| Bharti et al. (2021)         | 0.28 [ 0.21, 0.34]      | 1.06       |
| Bloch et al. (2016)          | 0.31 [ 0.25, 0.36]      | 1.07       |
| Bourgeois et al. (2020)      | 0.34 [ 0.29, 0.39]      | 1.07       |
| Brouillette et al. (2015)    | 0.33 [ 0.26, 0.40]      | 1.06       |

Random-effects REML model

Overall
Heterogeneity: $\tau^2 = 0.04$, $I^2 = 98.06\%$, $H^2 = 51.67$
Test of $\theta = \theta_i$: $Q(81) = 5470.07$, $p = 0.00$
Test of $\theta = 0$: $z = 17.31$, $p = 0.00$
Brouillette et al. (2021)  0.52 [ 0.46, 0.59]  1.07
Carvalhal et al. (2016)  0.60 [ 0.55, 0.65]  1.08
Chalermchai et al. (2013)  0.51 [ 0.40, 0.62]  1.00
Ciccarelli et al. (2011)  0.12 [ 0.09, 0.15]  1.09
Cysique et al. (2010)  0.43 [ 0.36, 0.50]  1.06
Dampier et al. (2017)  0.59 [ 0.50, 0.68]  1.03
Darling et al. (2021)  0.40 [ 0.37, 0.43]  1.09
Day et al. (2016)  0.27 [ 0.22, 0.32]  1.08
de Almeida et al. (2017)  0.60 [ 0.48, 0.72]  0.98
Dufouil et al. (2015)  0.58 [ 0.54, 0.63]  1.08
Dufour et al. (2013)  0.22 [ 0.18, 0.27]  1.08
Elham et al. (2020)  0.51 [ 0.40, 0.61]  1.01
Ene et al. (2016)  0.37 [ 0.30, 0.43]  1.06
Fazeli, Woods & Vance (2019)  0.53 [ 0.46, 0.60]  1.05
Flatt et al. (2021)  0.47 [ 0.41, 0.53]  1.07
Foca et al. (2016)  0.47 [ 0.40, 0.54]  1.06
Gomez et al. (2019)  0.21 [ 0.17, 0.25]  1.08
Gott et al. (2017)  0.55 [ 0.45, 0.65]  1.02
Haddow et al. (2018)  0.26 [ 0.22, 0.30]  1.08
Heaton et al. (2008)  0.35 [ 0.29, 0.42]  1.06
Hestad et al. (2019)  0.37 [ 0.31, 0.42]  1.07
Imai et al. (2020)  0.26 [ 0.22, 0.30]  1.08
Joska et al. (2011)  0.74 [ 0.67, 0.81]  1.06
Joska et al. (2019)  0.76 [ 0.70, 0.83]  1.06
Kabuba et al. (2017)  0.35 [ 0.29, 0.40]  1.07
Kallianpur et al. (2016)  0.36 [ 0.34, 0.39]  1.09
Kamminga et al. (2017)  0.47 [ 0.34, 0.60]  0.96
Kelly et al. (2014)  0.70 [ 0.61, 0.79]  1.03
Kemp et al. (2021)  0.41 [ 0.33, 0.49]  1.04
Korten et al. (2021)  0.46 [ 0.38, 0.53]  1.05
Ku et al. (2014)  0.26 [ 0.20, 0.32]  1.06
Makinson et al. (2020)  0.35 [ 0.29, 0.42]  1.06
Matchanova et al. (2020)  0.60 [ 0.52, 0.68]  1.04
McNamara et al. (2017)  0.51 [ 0.48, 0.55]  1.08
Milanini et al. (2017)  0.38 [ 0.36, 0.40]  1.09
Milanini et al. (2020)  0.53 [ 0.41, 0.64]  1.00
Mohamed, Oduor & Kinyanjui (2020)  0.81 [ 0.77, 0.85]  1.08
Molinaro et al. (2020)  0.59 [ 0.54, 0.64]  1.08
Mugendi et al. (2019)  0.12 [ 0.09, 0.16]  1.09
Namagga et al. (2019)  0.58 [ 0.53, 0.63]  1.08
Nichols et al. (2013)  0.65 [ 0.58, 0.71]  1.06
Nyamayaro et al. (2020)  0.50 [ 0.42, 0.58]  1.05
Odiase, Oggunrin & Ogunniyi (2006)  0.66 [ 0.59, 0.72]  1.06
Oshinaike et al. (2012)  0.03 [ 0.01, 0.05]  1.09
Overton et al. (2013)  0.51 [ 0.44, 0.58]  1.06
Patel et al. (2010)  0.14 [ 0.09, 0.19]  1.08
Perez-Valero et al. (2013)  0.27 [ 0.21, 0.34]  1.06
Random-effects REML model

Heterogeneity: $\tau^2 = 0.03$, $I^2 = 98.34\%$, $H^2 = 60.25$

Test of $\theta = \theta_0$: $Q(93) = 6159.46$, $p = 0.00$

Test of $\theta = 0$: $z = 22.36$, $p = 0.00$

**Overall**

| Study                          | Effect Size | CI       | Weight |
|-------------------------------|-------------|----------|--------|
| Pinheiro et al. (2016)        | 0.54        | [0.49, 0.59] | 1.08   |
| Portilla et al. (2019)        | 0.30        | [0.20, 0.40] | 1.02   |
| Robertson et al. (2014)       | 0.45        | [0.42, 0.48] | 1.09   |
| Robertson et al. (2019)       | 0.41        | [0.40, 0.43] | 1.09   |
| Sacktor et al. (2014)         | 0.33        | [0.28, 0.38] | 1.08   |
| Sacktor et al. (2016)         | 0.92        | [0.87, 0.97] | 1.08   |
| Sanmarti et al. (2020)        | 0.19        | [0.14, 0.24] | 1.08   |
| Sevigny et al. (2007)         | 0.69        | [0.63, 0.74] | 1.08   |
| Spector et al. (2010)         | 0.37        | [0.30, 0.43] | 1.06   |
| Starace et al. (2002)         | 0.18        | [0.14, 0.22] | 1.08   |
| Sundermann et al. (2018)      | 0.43        | [0.40, 0.45] | 1.09   |
| Tilghman et al. (2014)        | 0.36        | [0.29, 0.44] | 1.05   |
| Tomita et al. (2019)          | 0.44        | [0.36, 0.51] | 1.05   |
| Tozzi et al. (2005)           | 0.54        | [0.50, 0.59] | 1.08   |
| Trunfo et al. (2018)          | 0.22        | [0.18, 0.25] | 1.09   |
| Tsegaw et al. (2017)          | 0.36        | [0.33, 0.40] | 1.08   |
| Underwood et al. (2019)       | 0.21        | [0.18, 0.25] | 1.09   |
| Valcour et al. (2004)         | 0.20        | [0.14, 0.25] | 1.07   |
| Vassallo et al. (2015)        | 0.30        | [0.24, 0.36] | 1.06   |
| Vergori et al. (2019)         | 0.23        | [0.19, 0.26] | 1.09   |
| Wang et al. (2013)            | 0.48        | [0.43, 0.54] | 1.07   |
| Winston et al. (2013)         | 0.51        | [0.47, 0.55] | 1.08   |
| Wojna et al. (2007)           | 0.68        | [0.57, 0.80] | 0.99   |
| Wright et al. (2008)          | 0.12        | [0.09, 0.14] | 1.09   |
| Wubetu, Asefa & Gebregiorgis (2021) | 0.41 | [0.36, 0.46] | 1.08   |
| Xiao et al. (2020)            | 0.87        | [0.83, 0.91] | 1.08   |
| Yakasai et al. (2015)         | 0.76        | [0.67, 0.86] | 1.03   |
| Yechoor et al. (2016)         | 0.38        | [0.31, 0.45] | 1.06   |
| Yideg et al. (2019)           | 0.36        | [0.31, 0.41] | 1.07   |
| Yusuf et al. (2017)           | 0.22        | [0.18, 0.25] | 1.08   |
| Zamudio-Rodriguez et al. (2018)| 0.66 | [0.60, 0.72] | 1.06   |
| Zhang et al. (2012)           | 0.37        | [0.29, 0.45] | 1.04   |
| Zhao et al. (2015)            | 0.37        | [0.31, 0.44] | 1.06   |

**Overall**

Heterogeneity: $\tau^2 = 0.03$, $I^2 = 98.34\%$, $H^2 = 60.25$

Test of $\theta = \theta_0$: $Q(93) = 6159.46$, $p = 0.00$

Test of $\theta = 0$: $z = 22.36$, $p = 0.00$
Supplementary Figure 28: Bubble plot of cognitive impairment by gender. 221 studies reported the gender of their participants. The size of the data points reflects the study’s sample size. Figure made using STATA.

Supplementary Figure 29: Bubble plot of cognitive impairment by ART coverage. 181 studies reported ART coverage among their participants. The size of the data points reflects the study’s sample size. Figure made using STATA.
Supplementary Figure 30: Bubble plot of cognitive impairment by age. A) 64 studies reported the age as a median. B) 141 studies reported the age as a mean. The size of the data points reflects the study’s sample size. Figure made using STATA.
Supplementary Figure 31: Bubble plot of cognitive impairment by publishing year. All studies are included in this plot. The size of the data points reflects the study’s sample size. Figure made using STATA.

Supplementary Figure 32: Bubble plot of cognitive impairment by sample size. All studies are included in this plot. The size of the data points reflects the study’s sample size. Figure made using STATA.
Supplementary Figure 33: Funnel plot to assess publication bias. Each data point represents a study. Figure made using STATA.