



**Alzheimer's Disease  
International**

*The global voice on dementia*

# The Global Impact of Dementia 2013–2050

## Online Appendix

The main document can be found at [www.alz.co.uk/G8policybrief](http://www.alz.co.uk/G8policybrief)

## Systematic Review and Meta-analysis of the prevalence of dementia in Sub-Saharan Africa

### Methods

We conducted a systematic review of the literature on the prevalence of dementia with Pubmed/ Medline up to October 2013 using the search terms:

(dementia[MeSH Terms]) AND (epidemiology[MeSH Terms] OR prevalence[MeSH Terms]) AND (africa[MeSH Terms])

or

(dementia[MeSH Terms]) AND (epidemiology[MeSH Terms] OR prevalence[MeSH Terms]) AND (country[MeSH Terms]) for each country in the SSA region (according to GBD regions).

We sought and included population-based studies of the prevalence of dementia among people aged 60 years and over (according to DSM-IV or ICD-10 criteria, or similar clinical criteria), for which the fieldwork started on or after 1<sup>st</sup> January 1980.

Exclusion criteria related to sampling, case ascertainment procedures, and outcome definitions:

#### A) Sampling design

- 1) Studies of prevalence from the follow-up phase (rather than the inception phase) of a population cohort
- 2) Studies sampling from an out-of-date population register (prepared more than three years prior to the survey)
- 3) Studies of nursing home or residential care populations, primary care attendees or other unrepresentative service-user populations

#### B) Ascertainment / outcome definition

- 1) Studies in which the ascertainment of dementia depended upon help-seeking and/ or receipt of dementia care services
- 2) Studies in which 'dementia' was diagnosed purely on the basis of cognitive impairment, for example according to a cutpoint on the Community Screening Instrument for Dementia (CSI-D)
- 3) Two phase studies, in which screening procedures were clearly inadequate and two phase methodology was not properly applied. This applied to all large scale screening studies of people of all ages for all neurological disorders.
- 4) Studies of the prevalence of Alzheimer's disease or other subtypes of dementia, or restricted to young onset dementia.

## **Procedures**

MP and MG read the abstracts of all publications identified on the electronic databases, excluding only those that clearly did not meet the above criteria. In the next stage, printed copies of the remaining publications were read by MP and MG, and a consensus was made on those that met all criteria. We read studies published in English and French. All eligible studies were systematically coded for their study design and quality. Quality scores for several elements were attributed as following:

- Sample size – <500, 0.5 points; 500-1499, 1 point; 1500-2999, 1.5 points;  $\geq$ 3000 2 points
- Study Design – Two phase study with no sampling of screen negatives, 0 points; two phase study with sampling of screen negatives but no weighting back, 1 point; one phase study or two phase study with appropriate sampling and weighting, 2 points
- Response proportion – <60%, 1 point; 60-79%, 2 points;  $\geq$ 80%, 3 points
- Diagnostic assessment – one point each for multidomain cognitive test battery, formal disability assessment, informant interview and clinical interview

## **Data extraction**

For studies reporting unweighted prevalence, we extracted either the numerator and denominator, or the prevalence and denominator, or the prevalence and standard error, or the prevalence and 95% confidence intervals. Numerator and denominator could then be calculated from any of these combinations.

For studies reporting weighted prevalence we extracted either the weighted prevalence and the weighted standard error or the weighted 95% confidence intervals. Effective numerators and denominators (taking account of the design effect) could then be calculated.

Prevalence estimates were stratified differently in different publications. Age-specific prevalence data could generally be calculated from age- and sex-specific estimates. If studies provided age-specific estimates not stratified by gender, gender-specific estimates not stratified by age or an overall prevalence stratified neither by age nor gender, we contacted the authors to request age- and gender-specific estimates. Therefore we could model the effect of age on dementia prevalence for all included studies.

### *Meta-analytical methods for estimating dementia prevalence in SSA*

We used a random effect exponential (Poisson) model to assess the effects of age on the prevalence of dementia. Random effects are assumed to have a gamma distribution – the alpha coefficient is an estimate of overdispersion and an index of between-study heterogeneity. Age was coded as the mean for each age group reported. For SSA countries, this was calculated from the mean observed in 4 population-based studies in West and Central Africa for which individual data was available [1-3].

We ran one model for the effect of age and then applied the relevant mean ages to the coefficients estimated from the models, to estimate prevalence in five year age-bands from 65-84 years, and for those aged 85 and over, for both sexes combined.

## **Results**

The initial search of PubMed/Medline database yielded abstracts for 316 publications. After reading the abstracts, 306 publications were excluded as clearly ineligible (not carried out in SSA and/or before 1980, reviews, case or hospital-based studies, studies on other neurological or psychiatric disorders), leaving 10 publications for further review [1-10]. We obtained copies of the full published version of each paper, which were then carefully assessed against inclusion/exclusion criteria and the citation of other relevant studies in SSA.

A further two publications were excluded at this stage [4, 7] while another one was retrieved scanning through reference lists [11], leaving 9 publications (describing 6 studies), of which 3 were duplicates [6, 8, 9], that were eligible for inclusion in the review.

For two of these publications, we requested more information from the authors in order to be able to use the data in the meta-analysis in another form other than the one provided in the publication.

Another study, which has currently only been published in international congresses, was included as its methodology fulfilled the inclusion criteria [12].

In total, seven studies were fully eligible for inclusion in the meta-analysis, covering five different countries (Nigeria, Benin, Central African Republic, Republic of Congo and Tanzania) [1-3, 5, 10-12].

Contact with experts was facilitated by ADI to identify further studies that could have been missed, but none were identified via this method.

The characteristics of the studies included in the meta-analysis are given in table 1.

After the regression, the age-specific prevalence of dementia was estimated at 2.00% for 65-69 years, 3.10% for 70-74 years, 5.14% for 75-79 years, 8.00% for 80-84 years and 18.17 for 85 and over.

Figure 1 shows the crude prevalence of dementia in each study and the new meta-analysed estimates for SSA.

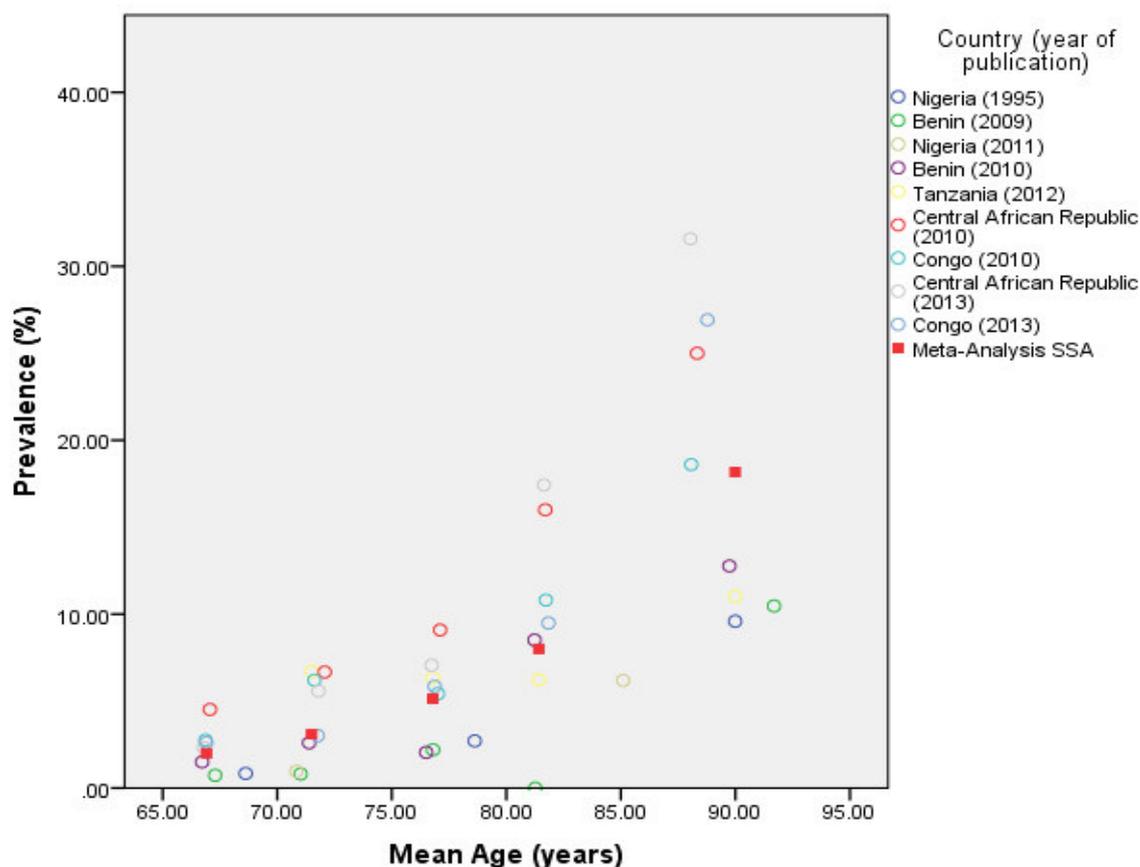


Figure 1 Prevalence of dementia by country and meta-analysed SSA

**Table 1 Characteristics of the studies included in the meta-analysis of dementia prevalence in SSA**

Reference	Country	GBD region	Lower age limit	Sampling	Design	Sample size	Numbers interviewed (proportion responding)	Screening instruments	Diagnostic criteria	Multidomain cognitive assessment? Disability? Neuroimaging?
Hendrie et al., 1995	Nigeria	SSA West	≤ 65	Door-to-door	2 stage	2535	2494 (98.4%)	CSI-D	DSM III-R/ICD10	Clinical assessment / ADL / CT scans
Ogunniyi et al., 2000	duplicate									
Yusuf et al., 2011	Nigeria	SSA West	≤ 65	Systematic random sampling	1 stage	322	322 (100%)	CSI-D	DSM-IV / ICD10	CERAD / Stick Design Test
Guerchet et al., 2009	Benin	SSA West	≤ 65	Door-to-door	2 stage	514	502 (97.6%)	CSI-D	DSM-IV	Clinical assessment / ADL
Paraiso et al., 2011	Benin	SSA West	≤ 65	Proportional sampling	2 stage	1162	1139 (98.0%)	CSI-D	DSM-IV	Clinical assessment / ADL
Guerchet et al., 2010	CAR	SSA Central	≤ 65	Door-to-door	2 stage	509	496 (97.4%)	CSI-D	DSM-IV	Clinical assessment / ADL
Mbelesso et al., 2012	duplicate									
Guerchet et al., 2010	Congo	SSA Central	≤ 65	Door-to-door	2 stage	546	520 (95.2%)	CSI-D	DSM-IV	Clinical assessment / ADL
Guerchet et al., 2013*	CAR	SSA Central	≤ 65	Door-to-door / proportional sampling	2 stage	1015	973 (95.9%)	CSI-D	DSM-IV	Clinical assessment / ADL
Guerchet et al., 2013*	Congo	SSA Central	≤ 65	Door-to-door / proportional sampling	2 stage	1098	1002 (91.2%)	CSI-D	DSM-IV	Clinical assessment / ADL
Longdon et al., 2012	Tanzania	SSA East	≤ 70	Exhaustive	2 stage	1260	1198 (95.1%)	CSI-D	DSM-IV	CERAD
Paddick et al., 2013	duplicate									

CAR = Central African Republic, CSI-D = Community Screening Instrument for Dementia, DSM = Diagnostic and Statistical Manual of Mental Disorders, ICD = International Classification of Diseases, ADL = Activities of Daily Living, CT = Computerized Tomography, CERAD = Consortium to Establish a Registry for Alzheimer's Disease.

\* = unpublished

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## Authors

Prof Martin Prince \*, Dr Maëleenn Guerchet \*, Dr Matthew Prina \*, Alzheimer's Disease International  
\* Global Observatory for Ageing and Dementia Care, Health Service and Population Research Department, King's College London

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