LASA DOCUMENTATION DEMENTIA ALGORITHM

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*Update involves:

- extending the dementia algorithm to include the I-wave (2015/16)

- updating the algorithm as follows:

In the first version of the algorithm, respondents with codes 3, 4 or 5 (uncertain) were recoded to 1 (dementia YES) if dementia was reported by the general practitioner (GP) and/or a specialist, but NOT if the observed MMSE decline was <2SD. This basically prioritizes the MMSE change over the GP/specialist diagnosis. We changed this. In the new algorithm, dementia status is set to yes if GP/specialist reported this yet MMSE change was <2SD. We applied this to all included measurement waves.

NB: because of this, the prevalence of dementia differs slightly from those reported in papers up to 2021 (e.g. those by van den Kommer et al.).

Description of algorithm

In LASA we have data from several cognitive tests, but a clinical dementia diagnosis on the basis of formal criteria is missing. Using the available MMSE's (Mini-Mental State Examination, a screening test for dementia, Folstein et al 1975), a telephone a shortened MMSE from people who would no longer participate (from D measurement), or an IQ code (Informant Questionnaire on Cognitive Decline in the Elderly;. Jorm et al, 1988) by the respondent (C measurement) or proxy (from the C measurement), we created a composite variable of people who are very likely have diagnosed dementia. Additionally, GPs data (dementia diagnosis by a general practitioner or specialist), relevant information listed on the respondent contact forms (RCF's), data recording used in psycho-geriatric nursing and information about cause of death (ICD coding different causes of dementia - to 2008 available) were used. The variable we created reflect a possible dementia, and when using it you have to interpret the findings with caution, because we are not completely sure that those persons are really dement.

Table 1 Summary of the numbers of people we have data

B 1992/93	**C** 1995/96	**D** 1998/99	**E** 2001/02	**2B*** 2002/03	**F** 2005/06	**G** 2008/09	**H** 2011/12	**3B*** 2012/13	**I** 2015/16
N=3.107	N=2.545	N=2.076	N=1.691	N=1002	N=2.165	N=1.818	N=1.522	N=1.023	N=1.770
MMSE: n=3.091	MMSE: n=2.292	MMSE: n=1.871	MMSE: n=1.469	MMSE: n=997	MMSE: =1.904	MMSE: n=1.600	MMSE: N=1.303	MMSE: N=1.023	MMSE: N=1.769
	-	short MMSE[1]: n=124	short MMSE[1]: n=121		short MMSE[1]: n=136	short MMSE[1]: n=112	short MMSE[1] n=97		short MMSE[1] n=148
	IQ-code resp[2]: n=163	-	-		-	-	-		-
	IQ-code proxy[3]: n=76	IQ-code proxy[3]: n=73	IQ-code proxy[3]: n=90		IQ-code proxy[3]: n=116	IQ-code proxy[3]: n=95	IQ-code proxy[3] n=171		IQ-code proxy[3] n=104

*2B and 3B are new cohorts of 55-65 year olds. These people were added on to the existing sample during follow-up

[1] Shortened MMSE (phone interview) = item 01: year; item 04: day of the week; item05: month; item 08: two streets in the neighborhood; item 10: address; item 11: repeat three words; item 12: 100-7 subtraction or item 13: backward spelling; item 14: remember three words. The total score is based on nine items - the best score of item 12 or 13 is counted. Maximum score = 16.

[2] IQ code by telephone for respondents who did not want to participate in the interview: 6 questions about decline in the past 10 years, namely: remember conversations; remembering his / her address and telephone number; dealing with major household appliances; make decisions; handling money for groceries; arrange finances. Scoring a 5-point scale: 1 = much better, 3 = unchanged, 5 = much worse. Scores ranging from 1- 30.

[3] IQ code is conducted by telephone with the proxy from the respondents who did not want to participate in the interview.

The diagnosis of 'probable dementia' (variable: *x*dement, where *x* stands for the wave (C-I)) was categorized in six categories at each wave:

Category 0	No dementia
Category 1	Dementia at wave *x*
Category 2	Dementia at the previous wave (*x* – 1)
Category 3	Undetermined: no data at subsequent wave(s), meaning that persistent MMSE decline could not be examined
Category 4	Undetermined: no persistent decline, yet MMSE score <=18
Category 5	Undetermined: inconsistent or contradictory data

The diagnosis of 'probable dementia' is determined by:
[[[1. MMSE difference score between the previous and current measurement cycle > 2 SD above average decline in the whole group

OR

2. If no main interview: difference scores on the short telephone version of the MMSE (> 2 SD above average decline from the whole sample)

OR

3. IQ code> 28 points, reflecting substantial decline in at least four areas]]]

AND

4. Persistent deterioration of cognitive functioning in the subsequent wave
– if further deterioration of MMSE was more than 1 SD: **xdement = 1.**
– if no follow-up measurement: **xdement = 3.**
– if further deterioration less than 1 SD but MMSE ≤ 18: **xdement = 4.**
– if respondents had conflicting or inconsistent information, or when too little information was available: **xdement=5.**

Subsequently, the following conditions could lead to the probable dementia diagnosis:

5. RCF's from people with category 3, 4 and 5 contained notes from the interviewer that mentioned cognitive impairment or dementia: **xdement = 1.**

OR

6. Data from general practitioner indicated that the GP or specialist diagnosed dementia: **xdement = 1** (also if the MMSE data indicated no persistent cognitive decline)

OR

7. Data on homing (014, 601 files) indicated that housing type was psycho-geriatric nursing home (≤ 3 years after the last interview): **xdement = 1.**

OR

8. Cause of death (z991) was dementia (≤ 3 years after the last interview): **xdement = 1.**

For questions about these variables, please contact: Almar Kok; a.kok1@amsterdamumc.nl

The variables (2017 version of the algorithm) are used and described in:

- Van den Kommer TN, Deeg DJH, Van der Flier WN, Comijs HC. Time trend in persistent cognitive decline: results from the Longitudinal Aging Study Amsterdam. In prep.
- Alders P, Comijs HC, Deeg DJH. Changes in admission to long-term care institutions in the Netherlands: comparing the results of two cohorts over the period 1996-1999 and 2006-2009. European Journal of Ageing, in press.
- van den Kommer TN, Comijs HC, Dik MG, Jonker C, & Deeg DJH. Development of classification models for early identification of persons at risk for persistent cognitive decline. Journal of Neurology, 2008, 255(10): 1486-94.

References

- Folstein MF, Folstein SE , McHugh PR. Mini-mental state: a practical method for the clinician. *J Psychiat Res,* 1975;12:189-198.
- Jorm AF, Korten AE. Assessment of cognitive decline in the elderly by informant interview. *Br J Psychiatr,* 1988;152:209–13.