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Methodological factors in determining risk of dementia after TIA and stroke: (II) impact of attrition on follow-up

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Abstract

Background and Purpose—Cognitive outcomes in cohorts and trials are often based only on face-to-face clinic assessment. However, cognitive impairment is strongly associated with increased morbidity and mortality, leading to substantial loss to clinic follow-up. In the absence of previous population-based data, we determined the impact of such attrition on measured risk of dementia after TIA and stroke.

Methods—Patients with TIA or stroke prospectively recruited (2002–2007) into the Oxford Vascular Study (OXVASC) had baseline clinical/cognitive assessment and follow-up to 2014. Dementia was diagnosed through face-to-face clinic interview, supplemented by home-visits and telephone-assessment in patients unable to attend clinic and by hand-searching of primary care records in uncontactable patients.

Results—Of 1236 patients (mean/sd age 75.2/12.1 years, 582 male), 527 (43%) died by 5-year follow-up. Follow-up assessment rates (study clinic, home visit or telephone) of survivors were 947/1026 (92%), 857/958 (89%), 792/915 (87%), and 567/673 (84%) at 1, 6, 12 months and 5 years. Dementia developed in 260 patients, of whom 110 (42%; n=50 primary care records, n=49 home visit, n=11 telephone follow-up) had not been available for face-to-face clinic follow-up at the time of diagnosis. The 5-year cumulative incidence of post-event dementia was 29% (26–32%) overall but was only 17% (14–19%) in clinic assessed versus 45% (39–51%) in non-clinic-assessed patients (p-difference<0.001).

Conclusions—Exclusion of patients unavailable for clinic follow-up reduces the measured risk of post-event dementia. Use of multiple follow-up methods including home visits, telephone assessments and consent to access primary care records substantially increases ascertainment of longer-term dementia outcomes.

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Author contributions

Sarah Pendlebury planned analyses, performed clinical assessments, collected and assessed data from medical records to make the dementia diagnoses in patients without direct study assessment and wrote the manuscript. P-J Chen, Linda Bull and Louise Silver collected data. Ziyah Mehta and Rose Wharton performed analyses and provided statistical expertise, and Peter Rothwell planned and directs the OXVASC study, co-wrote the manuscript and advised on analyses.

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Keywords

attrition; bias; dementia; TIA; stroke

Introduction

Stroke and dementia are inter-related conditions and each increases the risk of the other.¹ We have previously shown that risks of dementia in the first year after stroke are dependent on case-mix and that baseline selection criteria used in previous studies result in under-estimation of stroke-associated dementia.^{2–4} Bias may also occur in longitudinal studies as a result of selective loss to follow-up^{5,6} and such factors may result in under-estimation of the true dementia risk after stroke.⁷ A better understanding of the impact and reasons for attrition on the measured risk of dementia after TIA and stroke is required for planning clinical trials and large pragmatic studies and for calculating the true cognitive burden of symptomatic cerebrovascular disease.

We undertook a longitudinal population-based study of cognitive outcomes to 5-years after all TIA and stroke to determine the impact of attritional factors (death, and loss to follow-up owing to refusal or loss to contact) on case-mix and measured dementia risk. Dementia diagnosis was made by study interview in available patients and their informants and by indirect follow-up using hand-searching of primary care and hospital records for non-available patients.

Methods

Patients with TIA or stroke were prospectively recruited from 1st April 2002–31st March 2007 into the Oxford Vascular Study (OXVASC), a prospective population-based cohort study of all acute vascular events occurring within a defined population of 92 728 covered by nine primary care practices in Oxfordshire, UK.^{8,9} The study was approved by the local research ethics committee. Informed written consent (or assent from relatives) was obtained for study interview, for face-to-face and telephone follow-up and for indirect follow-up using primary care physician records, hospital records and death certificate data. Where patients died before first assessment or where assent from a family member could not be obtained in patients lacking capacity, the ethics committee approved review of the patient's medical records.

The study methods have been described in detail elsewhere.⁴ Patients were ascertained after index TIA or stroke by study clinicians through a combination of hot and cold pursuit.¹⁰ TIA and stroke were defined clinically by WHO criteria.¹¹ Major stroke was defined as National Institutes of Health Stroke Scale (NIHSS >3). Baseline brain and vascular imaging was performed and all cases were reviewed by a senior vascular neurologist (PMR). Leukoaraiosis was defined as absent, mild, moderate or severe as described previously.¹² Patient data were collected by interview using a standardised form and from general practitioner records.^{8,9} Risk factors were recorded at study entry. Functional status was assessed using modified Rankin¹³ and Barthel¹⁴ scores.

Follow-up interviews were done by trained research nurses at 1 and 6 months and 1 and 5 years either in the out-patient clinic or by home visit where hospital clinic visit was not possible. Telephone follow-up was done when face-to-face follow-up was not possible (eg because the patient had moved away from the area).

Cognitive testing was done at all follow-ups using one or more of MMSE,¹⁵ TICS¹⁶ and MoCA¹⁷ all of which have been validated against the National Institute of Neurological Disorders and Stroke-Canadian Stroke Network (NINDS-CSN) Vascular Cognitive Impairment Harmonisation Standards Neuropsychological Battery.^{18–21} For telephone testing, the TICS or telephone MoCA (out of 12)²¹ were used. Reasons for lack of study interview were recorded.

Dementia was defined as pre- or post-event according to whether the diagnosis was made before or after the index event.⁴ Post-event dementia diagnosis was made as described previously⁴ and required MMSE < 24 and remaining < 24 for all subsequent follow-ups or MoCA < 23 or TICS < 22 or T-MoCA < 9.²¹ For subjects with an incomplete test (ie testing was done but there was a problem such as dysphasia, visual impairment, inability to use the dominant arm), individual patient scores were reviewed: patients with cognitive scores above cut-off were designated as no-dementia. For those with scores below cut-offs, the entire clinical record was reviewed including that from primary care to determine whether the DSM-IV criteria²⁴ were met thus avoiding patients being spuriously classed as impaired on the basis of a low cognitive score. For patients without a direct study assessment, post-event dementia was diagnosed if there was a recorded diagnosis of dementia in the primary care record or if the DSM-IV criteria were met after hand-searching of the entire primary care record including individual consultations, hospital clinic letters, discharge letters and notes by a senior study physician/geriatrician (STP) with expertise in dementia or dementia was listed on the death certificate.

Statistical Analysis

Differences between dead and surviving, assessed and not-assessed patients were compared using analysis of variance (ANOVA) or χ^2 test as appropriate. Loss-to-follow-up was examined relative to the number of patients consenting or assenting to study follow-up at baseline, baseline selection bias having been considered in an earlier study.⁴ At each follow-up point, reasons for non-assessment were recorded as death, declining study or loss to contact or failure to attend/respond to invitation for study interview. In order to examine the impact of patient non-availability for clinic follow-up on measured rates of post-event dementia, we calculated the cumulative rate of post-event dementia for the whole cohort and then after exclusion of those whose dementia diagnosis was made i) on primary care searches ii) after a telephone follow-up and iii) after a home visit.

Results

1236 patients (mean age/sd 75.2/12.1 years, 582 (47%) male and 403 (33%) TIA, 370 (30%) major stroke, 65 (5%) primary intracerebral haemorrhage) were ascertained (figure 1) of which 992/1236 (80.1%) were first ever events. Only 26/1236 patients declined medical

notes/primary care records review resulting in study interview or consent/assent to indirect follow-up for 98% of patients.

Forty-seven patients died before ascertainment, 144/1236 (11.6%) had died by 1 month and 527 (42.6%) by the time of five year follow-up (figures 1 and 2). Death within the first month and thereafter was more likely with older age, prior functional dependency, pre-event dementia and major stroke (all $p < 0.05$). As a result, there was a change in the proportion of minor versus major events in survivors compared to the baseline cohort: at baseline, 370/1236 (30%) of the cohort had major stroke compared to only 244 (22%) of one month and 117/709 (16.5%) of 5-year survivors (figure 2).

Rates of follow-up study assessment (by clinic, home visit or telephone) in survivors who had entered the study at baseline were high at 947/1026 (92%), 857/958 (89%), 792/915 (87%), and 567/673 (84%) at 1, 6, 12 months and 5 years (figure 1, table 1). Assessments at 1, 6, 12 months and 5 years were done in the study clinic in 581 (61%), 60 (7%), 567 (72%) and 311 (55%); by home visit in 169 (18%), 656 (77%), 131 (16%) and 138 (24%); and by telephone in 15 (2%), 43 (5%), 44 (6%), and 52 (9%) (table 2, home visit was offered to all patients at 6 month follow-up). Patients having home visit or telephone assessments were older with more severe index events and more pre- and post-event dementia than those with study clinic follow-up (79.3/10.6 and 77.1/14.1 years versus 72.4/11.3 years; Supplemental Table I at <http://stroke.ahajournals.org>).

Clinical characteristics of assessed and non-assessed patients were generally similar although at one month, non-assessed patients had more pre-morbid dependency and at one year, non-assessed patients had more prior stroke and more TIA. Most assessed patients were resident at home (table 2). Patients living in care homes, with relatives or hospitalised at the time of assessment were older (86.1/6.7, 78.8/9.3, and 77.0/10.5 years) than those resident at home (72.4/11.5 years for one month assessment) and had had more severe index events and more pre- and post-event dementia (table 2, and Supplemental Table II at <http://stroke.ahajournals.org>). Lack of study assessment was most often because the patient had moved away or did not attend despite the efforts of study staff to trace patients with relatively few patients declining de novo over the course of study follow-up (table 2).

Dementia developed in 260 patients over 5-year follow-up, of whom 110 (42%; $n=50$ primary care records, $n=49$ home visit, $n=11$ telephone follow-up) had not been available for face-to-face clinic follow-up at the time of diagnosis. For the 50 dementia cases diagnosed indirectly through searching of primary care records, $n=15$ were diagnosed in year 0-1, $n=11$ in year 1-2, $n=8$ in year 2-3, $n=6$ in year 3-4 and $n=10$ in year 4-5. The 5-year cumulative incidence of post-event dementia was therefore only 17% (14-19%) in clinic assessed patients compared to 45% (39-51%) in non-clinic assessed patients (p -difference < 0.001) and was 29% (26-32%) for the cohort overall although differences were less marked at 1-year follow-up (figure 3).

Discussion

In our longitudinal study of over 1200 patients with TIA and stroke from a defined population, selective attrition occurred owing to death such that the proportion with major stroke dropped from nearly one third at baseline to less than one fifth by five years. In 260 post-event dementia cases diagnosed over 5-year follow-up, diagnosis was made in patients not assessed in the study clinic setting in over 40% of cases. As a result, there was a substantial reduction in the measured dementia **risk** when those unavailable for face-to-face study clinic follow-up were excluded.

Death was associated with older age, functional dependency and poor cognition in keeping with previous longitudinal ageing studies^{5,6} and also, unsurprisingly, with severity of the initial cerebrovascular event. Since the factors associated with death are similar to those for stroke-related dementia, attrition from death may indirectly lead to under-estimation of dementia if subjects die before dementia is ascertained. This can be mitigated, but probably not entirely removed, by shorter follow-up intervals and or use of indirect follow-up through medical records.

Although older age, cognitive impairment and severe illness have been associated with loss-to-follow-up in previous studies as well as with baseline selection bias,^{4–6} they were mitigated in our study by the use of multiple methods of follow-up to ascertain post-event dementia. Previous studies have shown that home visits and telephone follow-ups reduce attrition particularly amongst older people and those with greater illness burden such as care home residents.^{25,26} Our study shows that this is also the case in the TIA and stroke population since exclusion of dementia cases ascertained by home visit or telephone resulted in a substantial fall in the measured dementia risk since the risk was several fold higher in care home residents and those living with relatives. Our findings also illustrate the important contribution of primary care records searches, which have not been extensively used in previous studies. Post-event dementia risk was reduced by one sixth after exclusion of those whose diagnosis was made using this method.

There are few previous longitudinal studies of cognition after stroke and many have selection and attritional bias and or no data on unavailable patients.^{2,3} In the hospital-based Columbia, New York study of dementia three months after stroke, inclusion of non-available patients (who had proportionately more major dominant hemispherical stroke and prior stroke) resulted in an estimated relative 11% increase in measured dementia risk.⁷ Use of informant report may reduce selection and attrition but lack of data may still be associated with dysphasia, incontinence and older age.^{27,28} In the few longitudinal population-based studies of dementia after stroke, studies have been retrospective or of volunteer cohorts in which data were not provided for unavailable subjects.^{2,3}

Strengths of our study include the population-based design, documentation of reasons for unavailability and hand-searching of the entire primary care record for clinical details of unavailable patients. There are however, some limitations to our study. Short cognitive tests have imperfect sensitivities and specificities for dementia diagnosed using formal clinical criteria and the use of such tests in our study may have underestimated mild dementia or

over-estimated it, for example in subjects with low education. However, recent studies suggest the MMSE is an acceptable approach for detecting multi-domain cognitive impairment and dementia in this population and other large cohorts in whom lengthy assessments are impractical.^{23,29} Also, the method of dementia diagnosis was variable with a focus on short cognitive tests for study- assessed patients versus primary care records review for non-tested patients in whom dementia diagnosis would have been made by a variety of physicians and methods (eg geriatrician, neurologist, psychiatrist, primary care, STP). However, differences in method of dementia diagnosis are unlikely to have explained the higher dementia risks in those without face-to-face assessment given evidence of under-recording of dementia in primary care in the UK.³⁰ Finally, the long interval of four years between later follow-ups may have meant that more patients were lost to study follow-up than would otherwise have been the case thereby exaggerating the importance of primary care data

In conclusion, selective attrition from death occurred on follow-up to 5-years and those with major stroke made up a small minority of 5-year survivors. Risks of follow-up in survivors were high and assessed and non-assessed patients were similar owing to provision of home visits and telephone follow-up. Indirect follow-up through hand-searching of primary care records further mitigated selective attrition. Future longitudinal studies should offer alternatives to study clinic attendance and should consider patient consent/assent to primary care/medical records follow-up. Data should be provided on non-available patients together with risk-factor adjusted estimation of probability of impairment in those not assessed.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. Gorelick PB, Scuteri A, Black SE, Decarli C, Greenberg SM, Iadecola C, et al. Vascular contributions to cognitive impairment and dementia: A statement for healthcare professionals from the american heart association/american stroke association. *Stroke*. 2011; 42:2672–2713. [PubMed: 21778438]
2. Pendlebury ST, Rothwell PM. Prevalence, incidence, and factors associated with pre-stroke and post-stroke dementia: A systematic review and meta-analysis. *Lancet Neurol*. 2009; 8:1006–1018. [PubMed: 19782001]
3. Pendlebury ST. Dementia in patients hospitalized with stroke: rates, time course, and clinico-pathologic factors. *Int J Stroke*. 2012; 7:570–81. [PubMed: 22781124]

4. Pendlebury ST, Chen P-J, Bull L, Silver L, Mehta Z, Rothwell PM. Methodological factors in determining rates of dementia in TIA and stroke (I) Impact of baseline selection bias. *Stroke*. 2015; 46:641–6. [PubMed: 25657179]
5. Matthews FE, Chatfield M, Freeman C, McCracken C, Brayne C, MRC CFAS. Attrition and bias in the MRC cognitive function and ageing study: an epidemiological investigation. *BMC Public Health*. 2004; 4:12. [PubMed: 15113437]
6. Chatfield MD, Brayne CE, Matthews FE. A systematic literature review of attrition between waves in longitudinal studies in the elderly shows a consistent pattern of dropout between differing studies. *J Clin Epidemiol*. 2005; 58:13–9. [PubMed: 15649666]
7. Desmond DW, Bagiella E, Moroney JT, Stern Y. The effect of patient attrition on estimates of the frequency of dementia following stroke. *Arch Neurol*. 1998; 55:390–4. [PubMed: 9520013]
8. Rothwell PM, Coull AJ, Giles MF, Howard SC, Silver LE, Bull LM, et al. Oxford Vascular Study. Change in stroke incidence, mortality, case-fatality, severity, and risk factors in Oxfordshire, UK from 1981 to 2004 (Oxford Vascular Study). *Lancet*. 2004; 363:1925–33. [PubMed: 15194251]
9. Rothwell PM, Coull AJ, Silver LE, Fairhead JF, Giles MF, Lovelock CE, et al. Oxford Vascular Study. Population-based study of event-rate, incidence, case fatality, and mortality for all acute vascular events in all arterial territories (Oxford Vascular Study). *Lancet*. 2005; 366:1773–83. [PubMed: 16298214]
10. Coull AJ, Silver LE, Bull LM, Giles MF, Rothwell PM, Oxford Vascular (OXVASC) Study. Direct assessment of completeness of ascertainment in a stroke incidence study. *Stroke*. 2004; 35:2041–5. [PubMed: 15256682]
11. Hatano S. Experience from a multicentre stroke register: A preliminary report. *Bull World Health Organ*. 1976; 54:541–553. [PubMed: 1088404]
12. Simoni M, Li L, Paul NL, Gruter BE, Schulz UG, Küker W, et al. Age- and sex-specific rates of leukoaraiosis in TIA and stroke patients: population-based study. *Neurology*. 2012; 79:1215–22. [PubMed: 22955138]
13. Rankin J. Cerebrovascular accidents in patients over the age of 60:2 Prognosis. *Scott Med J*. 1957; 2:200–215. [PubMed: 13432835]
14. Mahoney FI, Barthel DW. Functional Evaluation: The Barthel Index. *Md State Med J*. 1965; 14:61–5.
15. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res*. 1975; 12:189–198. [PubMed: 1202204]
16. Brandt J, Spencer M, Folstein M. The Telephone Interview for Cognitive Status. *Neuropsychiatry Neuropsychol Behavioral Neurol*. 1988; 1:111–117.
17. Nasreddine ZS, Phillips NA, Bedirian V, Charbonneau S, Whitehead V, Collin I, et al. The montreal cognitive assessment, moca: A brief screening tool for mild cognitive impairment. *J Am Geriatr Soc*. 2005; 53:695–699. [PubMed: 15817019]
18. Hachinski V, Iadecola C, Petersen RC, Breteler MM, Nyenhuis DL, Black SE, et al. National Institute of Neurological Disorders and Stroke-Canadian Stroke Network vascular cognitive impairment harmonization standards. *Stroke*. 2006; 37:2220–2241. [PubMed: 16917086]
19. Pendlebury ST, Cuthbertson FC, Welch SJ, Mehta Z, Rothwell PM. Underestimation of cognitive impairment by mini-mental state examination versus the montreal cognitive assessment in patients with transient ischemic attack and stroke: A population-based study. *Stroke*. 2010; 41:1290–1293. [PubMed: 20378863]
20. Pendlebury ST, Mariz J, Bull L, Mehta Z, Rothwell PM. Moca, ACE-R and MMSE versus the national institute of neurological disorders and stroke-canadian stroke network vascular cognitive impairment harmonization standards neuropsychological battery after TIA and stroke. *Stroke*. 2012; 43:464–469. [PubMed: 22156700]
21. Pendlebury ST, Welch SJ, Cuthbertson FC, Mariz J, Mehta Z, Rothwell PM. Telephone assessment of cognition after TIA and stroke: TICSm and telephone MoCA vs face-to-face MoCA and neuropsychological battery. *Stroke*. 2013; 44:227–9. [PubMed: 23138443]

22. Mitchell AJ. A meta-analysis of the accuracy of the mini-mental state examination in the detection of dementia and mild cognitive impairment. *J Psychiatr Res.* 2009; 43:411–431. [PubMed: 18579155]
23. Lees R, Selvarajah J, Fenton C, Pendlebury ST, Langhorne P, Stott DJ, et al. Test accuracy of cognitive screening tests for diagnosis of dementia and multidomain cognitive impairment in stroke. *Stroke.* 2014; 45:3008–18. [PubMed: 25190446]
24. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). ed 4. Washington: American Psychiatric Association, 24 International standard classification; 1994.
25. Peterson JC, Pirraglia PA, Wells MT, Charlson ME. Attrition in longitudinal randomized controlled trials: home visits make a difference. *BMC Med Res Methodol.* 2012; 12:178. [PubMed: 23176384]
26. Zhou M, Holden L, Bedard G, Zeng L, Lam H, Chu D, et al. The utilization of telephone follow-up in the advanced cancer population: a review of the literature. *J Comp Eff Res.* 2012; 1:509–17. [PubMed: 24236470]
27. Henon H, Durieu I, Guerouaou D, Lebert F, Pasquier F, Leys D. Poststroke dementia: Incidence and relationship to prestroke cognitive decline. *Neurology.* 2001; 57:1216–22. [PubMed: 11591838]
28. Inzitari D, Di Carlo A, Pracucci G, Lamassa M, Vanni P, Romanelli M, et al. Incidence and determinants of poststroke dementia as defined by an informant interview method in a hospital-based stroke registry. *Stroke.* 1998; 29:2087–93. [PubMed: 9756587]
29. Pendlebury ST, Mariz J, Bull L, Mehta Z, Rothwell PM. Impact of different operational definitions on mild cognitive impairment rate and MMSE and MoCA performance in transient ischaemic attack and stroke. *Cerebrovasc Dis.* 2013; 36:355–62. [PubMed: 24217342]
30. Iliffe S, Robinson L, Brayne C, Goodman C, Rait G, Manthorpe J, et al. DeNDRoN Primary Care Clinical Studies Group. Primary care and dementia: 1. diagnosis, screening and disclosure. *Int J Geriatr Psychiatry.* 2009; 24:895–901. [PubMed: 19226529]

Figure 1.
Number of patients dying and assessed and not assessed between ascertainment and 5 years.

Figure 2.
Proportion of patients surviving by event type and month of follow-up.

Figure 3.

1- (black bars) and 5-year (grey bars) cumulative incidence of post-event dementia for the whole cohort, after exclusion of dementia cases found on primary care searches, after additional exclusion of those whose dementia diagnosis was made after a home visit or after telephone follow-up and after exclusion of all cases diagnosed other than at face-to-face study clinic.

Table 1
Demographic and clinical details of assessed versus non-assessed patients at each follow-up time point.

	1 month		6 month		1 year		5 years	
	Not assessed	Assessed	Not assessed	Assessed	Not assessed	Assessed	Not assessed	Assessed
Mean/sd age at event	N=79 72.4/14.5	N=947 73.8/11.8	N=101 71.3/14.4	N=857 73.3/11.8	N=123 72.6/13.5	N=792 72.8/11.8	N=106 68.6/13.5	N=567 70.0/11.6
Male sex	39 (49)	452 (48)	44 (44)	418 (49)	60 (49)	378 (48)	43 (41)	279 (49)
TIA (vs stroke)	29/77 (38)	347/940 (37)	46/98 (47)	326/851 (38)	59/121 (49)	306/785 (39)	46/104 (46)	236/562 (42)
TIA	29/77 (38)	347/940 (37)	46/98 (47)	326/851 (38)	59/121 (49)	306/785 (39)*	46/104 (46)	236/562 (42)
Minor Stroke	22 (28)	391 (42)	34 (35)	356 (42)	36 (30)	336 (43)	37 (36)	236 (42)
Major stroke	26 (34)	202 (22)	18 (18)	169 (20)	26 (21)	143 (18)	19 (18)	90 (16)
Rankin 3	20/73 (27)	151/932 (16)*	12/97 (12)	122/841 (15)	15/118 (13)	96/777 (12)	10/103 (10)	40/559 (7)
Barthel < 20	27/72 (38)	215/927 (23)*	21/97 (22)	183/837 (22)	27/117 (23)	152/775 (20)	15/102 (15)	83/555 (15)
Prior TIA	14 (18)	155 (16)	17 (17)	142 (17)	19/113 (17)	129 (16)	21 (20)	84 (15)
Prior stroke	11/ (14)	155 (16)	20 (20)	125 (15)	24/113 (21)	107 (14)*	12 (11)	72 (13)
Leukoaraiosis								
None	33/66 (50)	476/847 (56)	55/85 (65)	436/763 (57)	55/101 (54)	424/711 (60)	65/87 (74)	326/501 (65)
Mild	16 (24)	204 (24)	13 (15)	182 (24)	21 (21)	164 (23)	11 (13)	101 (20)
Moderate/Severe	17 (26)	167 (20)	17 (20)	145 (19)	25 (25)	123 (17)	11 (13)	74 (15)
All dementia								
Pre-event dementia	5 (6)	48 (5)	6 (6)	30 (4)	3 (2)	23 (3)	3 (3)	10 (2)
Post-event dementia	19/74 (26)	241/899 (27)	27/95 (25)	217/827 (26)	31/120 (26)	191/769 (25)	27/103 (26)	87/557 (16)

* p<0.05. Numbers are n (%).

Table 2

Numbers of assessed patients by follow-up type, place of residence and reasons for lack of study assessment in non-assessed patients for each follow-up time.

	1 month	6 months	1 year	5 years
Dead	144	219	274	527
Survivors (of those entering study at baseline)	1026	958	915	673
Assessed survivors (n)	947	857	792	567
Follow-up type				
Study clinic	581 (61)	60 (7)	567 (72)	311 (55)
Home visit	169 (18)	656 (77)*	131 (16)	138 (24)
Telephone call	15 (2)	43 (5)	44 (6)	52 (9)
Other	182 (19)	99 (11)	44 (6)	66 (12)
Place of residence				
Own home	706 (75)	695 (81)	652 (82)	449 (79)
Nursing home	29 (3)	54 (6)	57 (7)	47 (8)
Relative's home	83 (9)	72 (8)	59 (7)	43 (8)
Hospital	109 (12)	17 (2)	7 (1)	1 (<1)
Other	1 (<1)	2 (<1)	3 (1)	3 (<1)
Unknown	19 (2)	17 (2)	14 (2)	24 (4)
Non-assessed survivors (n)	79	101	123	106
Declined interview or no consent/assent; declining de novo	13 (9); N/A	33 (33); 22	43 (35); 15	36 (34); 9
Lost contact or did not attend; lost contact or did not attend de novo	54 (38); N/A	51 (50); 38	67 (54); 49	53 (50); 34
Other	12 (8)	17 (17)	13 (11)	17 (16)

Numbers are n (%).

* All patients were offered home visit at 6 month follow-up. De novo=patients who had been available for the previous study follow-up but who declined at this follow-up. N/A=not applicable.