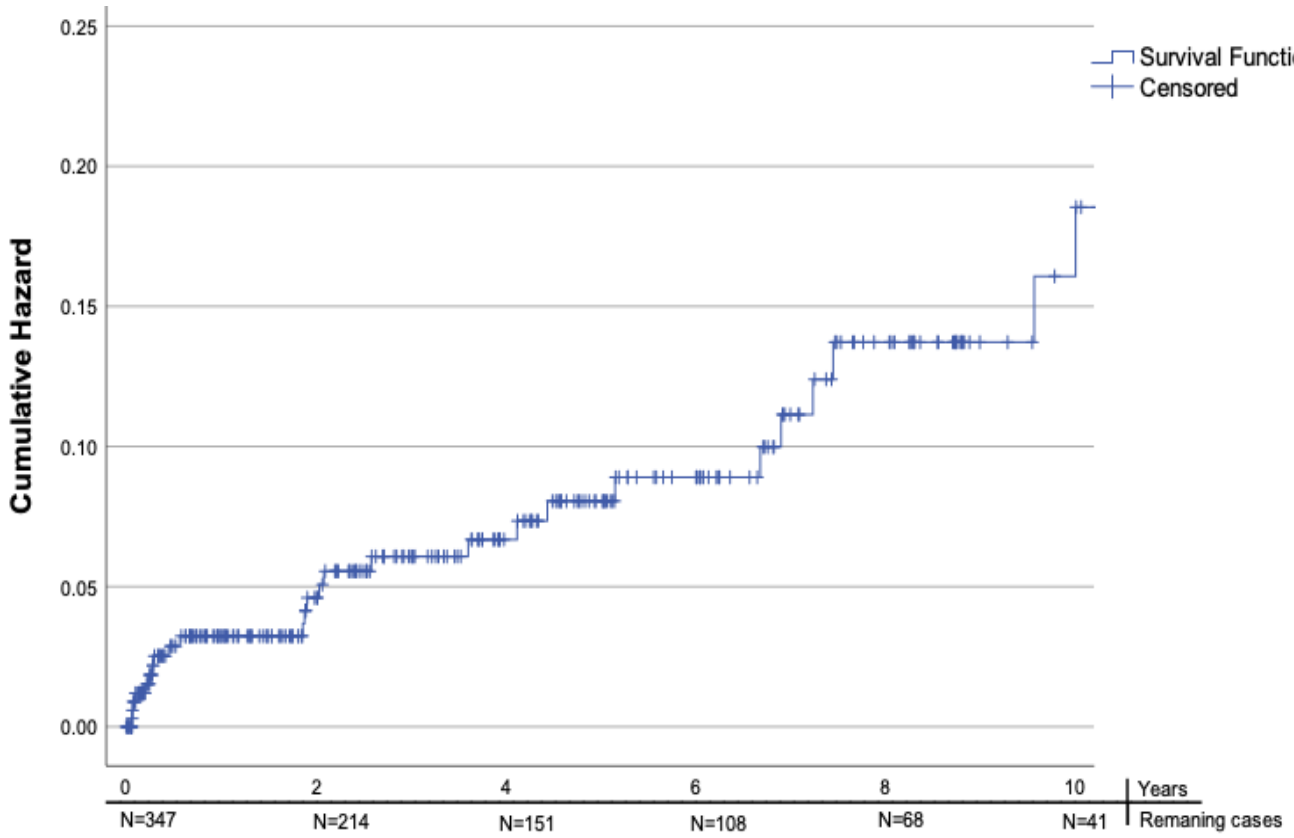
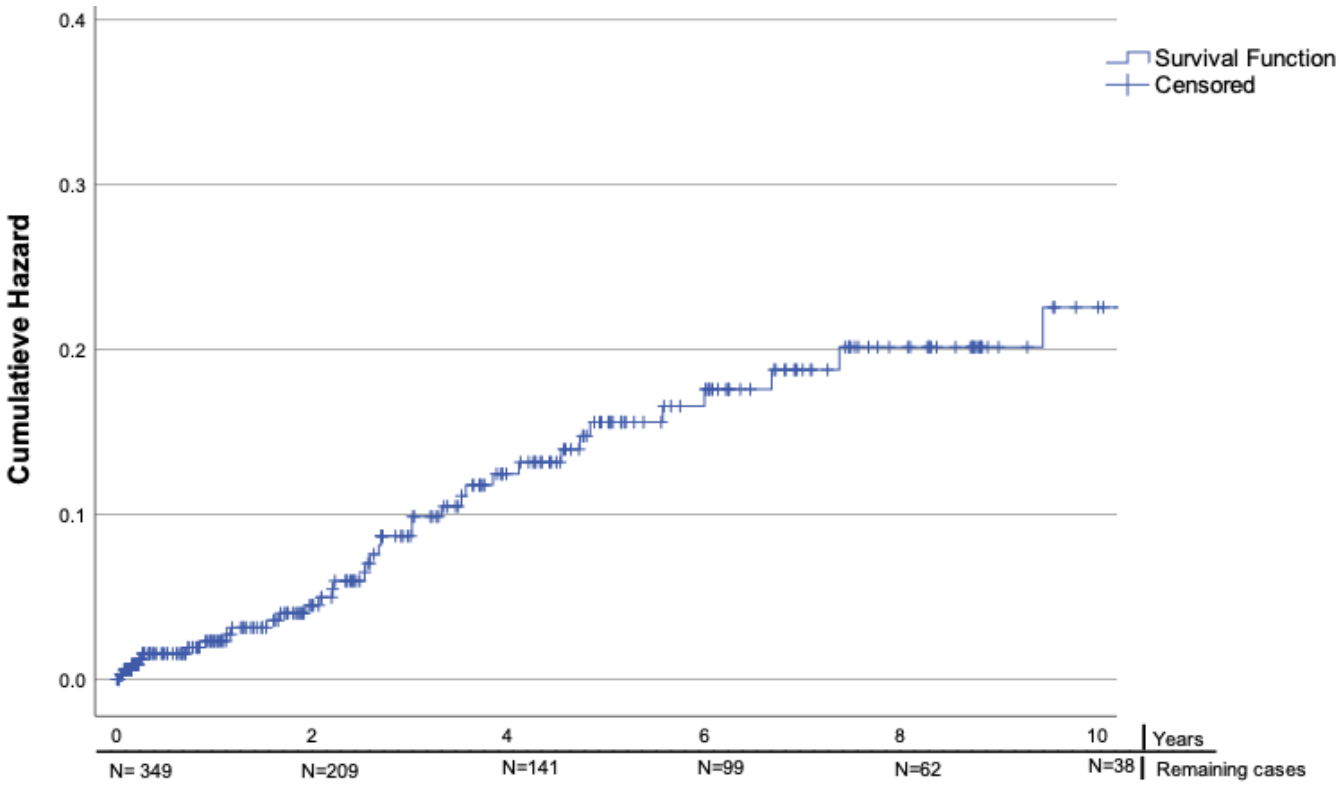
Supplemental Material to: Long-Term Outcomes in Patients with Spontaneous Cerebellar Hemorrhage: An International Cohort Study

Figure S1. Hazard function – cumulative hazard new intracerebral hemorrhage during follow-up



Legend S1:
Abbreviations: N denotes the number of remaining cases at a given time point.

Figure S2. Hazard function – cumulative hazard ischemic stroke during follow-up



Legend S2.
Abbreviations: N denotes the number of remaining cases at a given time point.

Table S1 – Data collection, extraction and follow-up time per center

Center	Location	Period	Data collection and extraction	Median follow-up time months (IQR)
Massachusetts General Hospital (MGH)	Boston, United States of America	1997-2017	Retrospective database from standardized research records in electronic patient files combined with most recent contact in clinical and research records, death certificates. Prospective: MGH ICH Cohort[24]	40 (15.8-91.4)
University Medical Center Utrecht (UMCU) + Elizabeth TweeSteden Ziekenhuis (ETZ)	Utrecht & Tilburg, The Netherlands	2007-2016	Retrospective database from standardized research records in electronic patient files combined with most recent contact in clinical and research records, death certificates, and phone calls to general practioners. Prospective: The Parelsnoer Initiative[25]	35 (4.2-69)
Maastricht University Medical Center (MUMC) + Zuyderland Medisch Centrum (ZMC)	Maastricht & Heerlen/Sittard, The Netherlands	2004-2009	Retrospective database from standardized research records in electronic patient files combined with most recent contact in clinical and research records, death certificates.	21 (5.8-91)
Centre Hospitalier Universitaire de Lille (CHU-L)	Lille, France	2004-2009	Prospective: Prognosis of InTraCerebral Haemorrhage (PITCH) Cohort[26]	80 (13-122)
Leiden University Medical Center (LUMC)	Leiden, The Netherlands	2010-2018	Retrospectively: most recent contact in clinical and research records, death certificates	15 (0.9-29)
Radboud University Medical Center (RUMC)	Nijmegen, The Netherlands	2013-2017	Retrospective database from standardized research records in electronic patient files combined with most recent contact in clinical and research records, death certificates.	46 (31-64)
John Radcliffe Hospital University of Oxford (OXVASC)	Oxford, United Kingdom	2004-2017	Prospective: Oxford Vascular Study (OXVASC)[27]	63 (44-106)
Clinical Brain Science Universy of Edinburgh (CCBS)	Edinburgh, United Kingdom	2010-2016	Prospective: The Lothian Audit of the Treatment of Cerebral Hemorrhage (LATCH)[28] and (Lothian IntraCerebral Hemorrhage, Pathology, Imaging and Neurological Outcome) LINCHPIN[29]	44 (14-74)

Legend Table S1. Data collection, extraction and follow-up time per center. Abbrevations: IQR: Interquartile Range

Table S2 – Baseline characteristics, full cohort, including non-survivors.

Baseline characteristics	**Full cohort, including non-survivors** (n=618)
Age in years, (mean, SD)	73.0 (13)
Female, n (%)	307 (50)
Ethnicity, n (%)	
Asian	15 (4.3)
Black	8 (2.3)
White	319 (91)
Other	9 (2.6)
Lifestyle risk factors, n (%)	
Smoking, ever	218 (46)
Smoking, at time of admission	70 (11)
Alcohol, ever	167 (73)
Alcohol, at time of admission	147 (45)
BMI in kg/m^2, median (IQR)	26.3 (23.4-29.4)
mRS pre-ICH, median (IQR)	0 (0-2)
GCS on admission, median (IQR)	14 (8-15)
Medical history, n (%)	
Hypertension	451 (74)
Diabetes Mellitus	111 (18)
Hypercholesterolemia	208 (34)
Ischemic Stroke	107 (18)
Transient Ischemic Attack	79 (14)
Previous intracerebral hemorrhage	44 (7.2)
Subarachnoid hemorrhage	2 (0.5)
Myocardial infarction	66 (11)
Atrial fibrillation/flutter	161 (27)
Medication use prior to ICH, n (%)	
Anticoagulation use	210 (31)
Antiplatelet therapy	139 (23)
Antihypertensive therapy	331 (65)
Lipid-lowering therapy	182 (31)
CT characteristics, n (%)	
Baseline ICH volume in mL, median (IQR)	13.0 (4.4-26.8)
Left	191 (49)
Right	168 (43)
Vermis	89 (23)
Intraventricular extension	224 (49)
Hydrocephalus	71 (54)
Treatment strategy, n (%)	
Conservative	406 (66)
Surgical	159 (28)
Length of hospital stay in days, median (IQR)	9 (3-19)

Legend Table S2: *Abbreviations: n denotes the total number of participants, % percentage, IQR inter-quartile range, SD standard deviation, BMI body mass index, mRS modified Rankin Scale, ICH intracerebral hemorrhage, GCS Glasgow Coma Scale, SBP systolic Blood Pressure and DBP Diastolic Blood Pressure, EVD External Ventricular Drainage, LoS Length of Stay*

Table S3 – baseline characteristics of included patients per center

Baseline characteristics included patients	**MGH** (n=153)	**UMCU & ETZ** (n=84)	**MUMC & ZMC** (n=59)	**CCBS** (n=32)	**CHU-L** (n=18)	**LUMC** (n=26)	**RUMC** (n=14)	**OXVASC** (n=19)
Age in years, (mean, SD)	72.7 (13.5)	69.5 (12.0)	74.9 (11.7)	74.6 (15.3)	67.7 (14.2)	72.2 (9.2)	67.9 (14.9)	73.8 (15.1)
Female, n (%)	71 (46.4)	43 (51.2%)	38 (64.4)	13 (40.6)	9 (50.0)	12 (46.2%)	5 (35.7)	11 (57.9)
Ethnicity, n (%)								
Asian	9 (6.2)	0 (0)	NA	NA	NA	0	0 (0)	0 (0)
Black	2 (1.4)	2 (4.4)	NA	NA	NA	0	0 (0)	1 (5.3)
White	134 (92.2)	42 (91.3)	NA	NA	NA	18 (94.7)	14 (100)	18 (94.7)
Other	4 (2.8)	2 (4.4)	NA	NA	NA	1 (5.3)	0 (0)	0 (0)
Lifestyle risk factors, n (%)								
Smoking, ever	69 (55.2)	40 (57.1)	12 (30.8)	15 (46.9)	2 (11.1)	11 (52.4)	4 (36.43)	2 (11.1)
Smoking, at time of admission	15 (12)	17 (24.6)	NA	7 (21.9)	NA	3 (13.6)	3 (27.3)	NA
Alcohol, ever	49 (100)	35 (70)	NA	11 (100)	3 (16.7)	17 (85.0)	4 (40.0)	7 (100)
Alcohol, at time of admission	49 (40.5)	31 (50)	NA	11 (37.9)	NA	14 (66.7)	4 (40.0)	7 (58.3)
BMI in kg/m^2, median (IQR)	27.0 (24.4-30.9)	25.7 (22.6-28.0)	NA	NA	NA	27.4 (23.3-31.7)	23.4 (23.0-26.3)	NA
mRS pre-ICH, median (IQR)	1 (0-2)	0 (0-2)	NA	1 (1-3)	0 (0-1)	0 (0-2)	0 (0-2)	NA
GCS on admission, median (IQR)	15 (14-15)	14 (12-14)	15 (13-15)	14 (14-15)	15 (14-15)	15 (14-15)	14 (13-15)	15 (14-15)
Medical history, n (%)								
Hypertension	128 (84.2)	54 (64.3)	41 (69.5)	25 (78.1)	13 (72.2)	15 (57.7)	8 (57.2)	14 (73.7)
Diabetes Mellitus	37 (24.3)	12 (14.3)	13 (22.0)	3 (9.4)	5 (27.8)	7 (26.9)	0 (0)	3 (15.8)
Hypercholesterolemia	74 (48.7)	20 (24.4)	16 (28.1)	6 (18.8)	5 (27.8)	7 (26.9)	4 (28.6)	6 (31.6)
Ischemic Stroke	38 (25.0)	7 (8.3)	10 (17.0)	10 (31.3)	1 (5.6)	6 (24.0)	1 (7.1)	4 (21.1)
Transient Ischemic Attack	16 (12.1)	12 (14.3)	9 (15.3)	6 (18.8)	2 (11.1)	6 (24.0)	2 (14.3)	3 (15.8)
Previous intracerebral hemorrhage	15 (10.0)	5 (6.0)	6 (10.2)	3 (9.4)	0 (0)	5 (19.2)	1 (7.1)	0 (0)
Subarachnoid hemorrhage	2 (1.4)	0 (0)	NA	NA	NA	0 (0)	0 (0)	NA
Myocardial infarction	9 (5.9)	5 (6.0)	18 (30.5)	8 (25.0)	1 (5.6)	0 (0)	1 (7.1)	0 (0)
Atrial fibrillation/flutter	39 (26.2)	13 (15.5)	15 (26.3)	16 (50.0)	1 (5.6)	10 (38.5)	2 (14.3)	5 (26.3)

Legend Table S3:
Abbreviations: MGH Massachusetts General Hospital, UMCU University Medical Center Utrecht, ETZ Elisabeth Tweesteden Ziekenhuis, MUMC Maastricht University Medical Center, ZMC Zuyderland Medisch Centrum, CCBS Center for Clinical Brain Science, University of Edinburgh, CHU-L Centre Hospitalier Universitaire de Lille, LUMC Leiden University Medical Center, OXVASC The Oxford Vascular Study, University of Oxford, RUMC Radboud University Medical Center, Nijmegen, n denotes the total number of participants, % percentage, IQR inter-quartile range, SD standard deviation, BMI body mass index, mRS modified Rankin Scale, ICH intracerebral hemorrhage, GCS Glasgow Coma Scale, mL milliliter, NA not applicable.

Baseline characteristics included cohort	**MGH** (n=153)	**UMCU & ETZ** (n=84)	**MUMC & ZMC** (n=59)	**CCBS** (n=32)	**CHU-L** (n=18)	**LUMC** (n-26)	**RUMC** (n=14)	**OXVASC** (n=19)
Medication use prior to ICH, n (%)								
Anticoagulation use	42 (27.5)	31 (36.9)	21 (35.6)	11 (34.4)	4 (22.2)	14 (53.9)	3 (21.4)	3 (15.8)
Antiplatelet therapy	15 (9.9)	28 (33.3)	21 (35.6)	13 (40.6)	3 (16.7)	8 (32.0)	5 (35.7)	4 (21.1)
Antihypertensive therapy	103 (68.2)	50 (59.5)	NA	24 (75.0)	13 (72.2)	14 (53.9)	7 (50.0)	11 (57.9)
Lipid-lowering therapy	63 (42.0)	22 (26.5)	11 (19.0)	12 (38.7)	4 (22.2)	11 (45.8)	5 (35.7)	4 (21.1)
CT characteristics. n (%)								
Baseline ICH volume in mL, median (IQR)	7.0 (2.14-15.0)	11.7 (5.1-19.3)	7.2 (3.4-16.4)	5.9 (1.8-13.4)	11.9 (2.7-14.7)	NA	16.6 (5.7-24.9)	NA
Left	75 (49.0)	48 (57.8)	NA	NA	NA	8 (40.0)	11 (78.6)	NA
Right	55 (36.0)	38 (45.8)	NA	NA	NA	10 (50.0)	6 (42.9)	NA
Vermis	23 (15.0)	22 (27.2)	NA	NA	NA	3 (15.0)	3 (21.4)	NA
Intraventricular extension	44 (31.7)	37 (44.1)	NA	13 (40.6)	6 (33.3)	6 (23.1)	5 (35.7)	NA
Hydrocephalus	NA	37 (44.1)	NA	NA	NA	NA	6 (42.9)	NA
Treatment Strategy, n (%)								
Conservative	99 (65.1)	58 (69.0)	41 (69.5)	NA	14 (77.8)	23 (95.8)	9 (74.3)	18 (94.7)
Surgical	53 (34.9)	26 (31.0)	18 (30.5)	NA	4 (22.2)	1 (4.2)	5 (35.7)	1 (5.3)
Length of hospital stay in days, median (IQR)	NA	14 (8-25)	14 (8-29)	NA	NA	9 (6-13)	13 (6-22)	NA

Legend Table S3:
Abbreviations: MGH Massachusetts General Hospital, UMCU University Medical Center Utrecht, ETZ Elisabeth Tweesteden Ziekenhuis, MUMC Maastricht University Medical Center, ZMC Zuyderland Medisch Centrum, CCBS Center for Clinical Brain Science, University of Edinburgh, CHU-L Centre Hospitalier Universitaire de Lille, LUMC Leiden University Medical Center, OXVASC The Oxford Vascular Study, University of Oxford, RUMC Radboud University Medical Center, Nijmegen, n denotes the total number of participants, % percentage, IQR inter-quartile range, SD standard deviation, BMI body mass index, mRS modified Rankin Scale, ICH intracerebral hemorrhage, GCS Glasgow Coma Scale, mL milliliter, NA not applicable.

Supplemental material

STROBE Statement—checklist of items that should be included in reports of observational studies
Article title: LONG-TERM CASE-FATALITY AND RECURRENCE RATE OF VASCULAR EVENTS IN PATIENTS WITH SPONTANEOUS CEREBELLAR HEMORRHAGE: AN INTERNATIONAL COHORT STUDY

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	P1,P4
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	P4,5
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	P6-7
Objectives	3	State specific objectives, including any prespecified hypotheses	P7
Methods			
Study design	4	Present key elements of study design early in the paper	P8, Table S1
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	P8-10 Table S1
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	P8-10 Table S1
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	P 8-10
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	P8-10 Table S1,S3
Bias	9	Describe any efforts to address potential sources of bias	P8-10,15,16
Study size	10	Explain how the study size was arrived at	P8,12, Fig 1
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	P 9-10
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	P 10
		(*b*) Describe any methods used to examine subgroups and interactions	P 9-10 Table S3
		(*c*) Explain how missing data were addressed	P9-10 Table S3
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	P9-10,12,13 Fig 1-3, Fig S1,2
		(*e*) Describe any sensitivity analyses	

Continued on next page

Supplemental material

Results			**Page**
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	P12-13, Fig 1-3 Fig S1,S2
		(b) Give reasons for non-participation at each stage	P12,Fig 1
		(c) Consider use of a flow diagram	P12 Fig 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	P 12 Table 1, Table S2,3
		(b) Indicate number of participants with missing data for each variable of interest	P 12 Table S3
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	P 8,9 Table S1
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	P12-13 Fig 2,3 Fig S1,S2
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	P12, Fig 2
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	P12-13, Fig 1-3 Fig S1,S2 Table 2
Discussion			
Key results	18	Summarise key results with reference to study objectives	P14,16
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	P15
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	P14-16
Generalisability	21	Discuss the generalisability (external validity) of the study results	P 14-16
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	P17

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.