

S3 Table Part A. Complete standardized form. Population characteristics of the 28 articles about development models

Publication	Name of the tool	Study design	Location of inclusion	Date of inclusion	Type of injuries	GCS	Population	Inclusion criteria	Non-inclusion criteria	Management of missing data	Main outcome	Secondary outcomes	Sample size	Number of events
Chang et al. 2017 Am J Hypertens [1]		Prospective US monocentric cohort	Extracted by ICD code, managed in ICU	2011/01 - 2015/12	ICH	NA	- Age mean 61.6 SD 14.0 - Female NA	- Spontaneous ICH - Time of adm. NA	- underlying vascular lesions - coagulation disorder	NA	Mortality at discharge		672	Mortality: 162 (24%)
Chuang et al. 2009 Int J Qual Health Care [2]	Simplified ICH score	Taiwan monocentric Registry	Registry of the NICU	2006/01 - 2007/12	ICH	32% GCS 3-8 23% GCS 9-13	- Age mean 60.6 SD 16.7 - Female 30%	- Adm. <24h of the onset - spontaneous ICH	- hemato. (leukemia) or coag. disorder	NA	Mortality at 1 month		NA: 217? 293?	Overall 40/293 (14%)
Di Napoli et al. 2011 Stroke [3]		Prospective Argentine multicenter (2) cohort	Admission in ICU	2005/11 - 2009/12	ICH	median 13 IQR 10-15	- Age mean 67.3 SD 11.5 - Female 42%	- Adm. <24h of the onset - spontaneous ICH	- history of infection, comorbidities, acquired in-hosp infection	- predictors: exclusion (n=19) - outcome: none	Overall mortality at 1 month		210	Mortality 63 (30%)
Edwards et al. 1999 Neurology [4]		Prospective US monocentric cohort	Admission in NICU	1996/12 - 1997/08	ICH	mean 9.8 SD 3.9	- Age mean 62.4 SD 16.1 - Female 42%	- supra-tentorial ICH - Time of adm. NA	- SAH - CT >24h after onset	NA	Mortality at discharge		81	Mortality: 21 (26%)
Fallenius et al. 2019 Stroke [5]		Retrospective analysis of prospective multicenter (4) cohort	Admission in ICU	2003 - 2013	ICH	Median 8 IQR 4-13	- Age median 61 IQR 52-69 - Female NA	Spontaneous ICH	- Isolated IVH	- Predictors: Complete Case only (Exclusion n=53) - Outcome: none	Mortality at 12 months		972	Mortality 421 (43%)
Godoy et al. 2006 Stroke [6]	Modified ICH-score (mICH-A, mICH-B)	Prospective Argentine bicentric cohort	Admission in ICU	2003/01 - 2004/07	ICH	median 11 IQR 7-14	- Age mean 66 SD 12 - Female 37%	- Adm. within <24h after onset - Spontaneous ICH	- brain tumours - haemorrhagic transformation of cerebral infarct - aneurysmal or vascular malformation rupture	- Predictors: exclusion - outcome: NA	Mortality at 1 month	Unfav. outcome (GOS 1-3) at 6 months	153	- Mortality at 1 month: 53 (35%) - Unfav. outcome at 6 months: 94 (62%)
Ho et al. 2016 SpringerPlus [7]		Taiwan prospective monocentric registry	Admission to NICU from ED	2009/01 - 2011/12	ICH	NA	- Age mean 62 SD 15 - Female 38%	- Adm. within <24h after onset - Spontaneous ICH		NA	Mortality at discharge		805	Mortality 164 (20.4%)

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Jeng et al. 2008 J Neuro Sci [8]		Taiwan monocentric Registry	Admission in stroke ICU	2002/11 - 2006/12	ICH	mean 10.6 SD 4.2	- Age mean 61.6 SD 13.5 - Female 39%	- Adm <12h of the onset - (Ischemic stroke or non-trauma ICH	- Rapid improvement - Transient ischemic attack - Anoxic-ischemic brain injury - SAH	NA	Mortality at 3 months	- Unfav. outcome (mRS>2 or Bartel index <80) at discharge - Mortality at 3 months	342	- Mortality: 62 (18%)
Lukic et al. 2012 Acta Neurol Belg [9]		Prospective data Origin NA	Admission in NICU	2005 - 2009	ICH	GCS mean 9 SD 4	- Age mean 67 SD 11 - Female 52%	Spontaneous ICH, adm <6h of the onset, medically treated	Oral anticoagulant therapy, severe concomitant disease or disability	NA	Mortality at discharge		411	Mortality 256 (62%)
Maas et al. 2017 Cerebrovasc Dis [10]		US monocentric prospective cohort	Admission in neuro-spine ICU	2010/01- 2016/03	ICH	GCS Median 14 IQR 8-15	- Age Mean 64.3 SD 13.6 - Female 50%		- Death from withdrawal of care - secondary ICH	Complete case analysis (exclusion n=135)	Unfav. Outcome (mRS 4-6) at 3 months		254	Fav outcome: 122 (48%)
Sembill et al. 2017 Neurology [11]	Max ICH-score	Retrospective analysis on prospective German monocentric registry	Admission in ICU	2007/01 - 2011/12	ICH	Median 13 IQR 10-15	- Age mean 70 SD 12 - Female 45.4%	Maximally treated spontaneous ICH	Early care limitations (<24 hours) (n=71)	- Predictors: exclusion (n=NA) - Outcome: exclusion (n=18)	Mortality at 12 months	- Mortality at 3 months - Unfav outcome (mRS 4-6) at 3 and 12 months	471	- 12-m mortality 142 (30.1%) - 12-m unfav outcome 214 (45.4%)
Ziai et al. 2015 Neurocrit Care [12]		Retrospective US bicentric cohort	Extracted by ICD code + managed in NICU	2003 - 2010	ICH	median 7 IQR 9	- Age mean 61.8 SEM 1.2 - Female 48%	- Spont. IVH - Adm within 24h of the onset	- Aneurysmal SAH - ICH w/ underlying lesions (tumor, AVM, aneurysm)	- Predictors: exclusion (13) - Outcome: NA	Mortality at discharge	Unfav outcome (mRS 4-6) at discharge	170	- Mortality: 87 (51%) - Unfav. outcome: 144 (85%)
Celi et al. 2012 J Pers Med [13]		Retrospective analysis on prospective US monocentric cohort	Admission in ICU	1995/01 - 2006/02	SAH	NA	NA			NA	Mortality at discharge		MIMIC database 150	Mortality: 57 (25.6%)
Claassen et al. 2004 Crit Care Med [14]	SAH-PDS	Prospective US monocentric cohort	Admission in NICU	1996/07 - 2002/06	SAH	NA	- Age mean 54 SD 14 - Female 71%	- Adm. < 3d after onset	- AVM	Predictors: NA Outcome: exclusion (n=NA)	Unfav. outcome (mRS 4-6) at 3 months		413	Unfav outcome: 167 (40.4%)
Czorlich et al. 2015 Acta Neurochir [15]	Improved SAPS II	German monocentric registry	All treated in ICU, recruitment location NA	2010/11 - 2014/11	aSAH	14-15 58% 11-13 8% 9-10 4% 6-8 8% 3-5 22%	- Age mean 54.4 SD 13.74 - Female 70%	- aneurysmal SAH	- Angiogram-negative perimesencephalic SAH (54) - AVM - prior syndromic disease	Predictors: exclusion (n=21) Outcome: NA	Mortality at discharge		242	Before exclusion Mortality: 49/263 (18.3%)

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Degos et al. 2012 Anesth [16]		Prospective French monocentric cohort	Admission in NICU	2002/01 - 2010/12	aSAH	median 14 IQR 12-15	- Age <60y: 708 60-70y: 138 ≥70y: 87 - Female 62%	- aneurysmal SAH angiographically confirmed - Treated = coiling or clipping	- No aneurysm procedure (n=67)	Predictors: exclusion (n=21) Outcome: none	Unfav. outcome (mRS 4-6) at 12 months (follow up visits or phone)		933 (526 from Degos et al, 2012 Stroke)	Unfav outcome: 180 (19.3%)
Degos et al. 2012 Stroke [17]	ABC score	Prospective French monocentric cohort	Admission in NICU	2003/01 - 2009/12	aSAH	median 14 IQR 11-15	- Age mean 50 SD 13 - Female 64%	- aneurysm SAH angiographically confirmed - coiled with or without stents	- invasive treatment (n=48) - open surgical clipping (n=168)	Predictors: exclusion (n=10) Outcome: NA	Mortality at 12 months	- independt function (mRS 0-3) at 12 months - full recovery (mRS 0-1) at 12 months	368	Mortality: 64 (17.4%) mRS 0-3: NA mRS 0-1: 257 (69.8%)
Kissoon et al. 2015 J Stroke Cerebrovasc Dis [18]		US monocentric registry	Admission in NICU	2001/10 - 2011/06	aSAH	WFNS: mean 2.3 SD 1.5	- Age mean 55.7 SD 13.5 - Female 66%	Aneurysmal SAH		Predictors: NA Outcome: exclusion (n=19)	Unfav. outcome (mRS 3-6) "during follow up" (mean 8 ± 8 months)		288	Unfav. outcome: 98 (34%)
Konczalla et al. 2016 World Neurosurg [19]		German monocentric registry	Surgical database, all admitted in NICU	2003 - 2012	SAH	WFNS 4-5 57%	- Age mean 53 SD 12 - Female 71%	- long lasting (> 14d) cerebral vasospasm - severe cerebral vasospasm or neuro deterioration + moderate-to-severe vasospasm		NA	Fav outcome (mRS 0-2) at 6 months		106	Fav outcome: 64 (60%)
Schuling et al. 2005 J Neurol Neurosurg Psychiatry [20]		Prospective Dutch monocentric cohort	Admission in ICU	2002/06 - 2004/02	SAH	WFNS 4-5 47%	- Age NA - Female 64%	<24 h after the onset		NA	Unfav outcome (mRS 4-6) at 3 months (follow up visit)		68	Unfav outcome: 40 (59%)
Schuling et al. 2005 Neurosurgery [21]		Retrospective Dutch monocentric cohort	Admission in ICU	2000/01 - 2002/06	SAH	WFNS 4-5 35%	- Age mean 55 range 17-93 - Female 73%	Adm < 4 d after onset	- non-aneurysmal perimesencephalic hemorrhage - moribond on adm	- Predictors: exclusion (n=2) - Outcome: NA	Unfav outcome (mRS 4-6) at 3 months		136	Unfav outcome: 65 (48%)

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Szklenner et al. 2015 BMJ open [22]		Prospective Polish monocentric cohort	Poor grade SAH (WFNS IV-V) disqualified from surgery, admitted in NICU	2001/01 - 2010/12	SAH	WFNS 4 27% WFNS 5 73%	- Age mean 57 range 21-87 - Female 43%	- Non-operated (disqualified) SAH - Adm <24h from the onset	- peri mesencephalic patterns of haemorrhage on CT - intoxication - Prior serious medical conditions	NA	Unfav outcome (mRS 5-6) at 1 month		101	Unfav outcome: 80 (79%)
Weiss et al. 2006 Anesthesiology [23]		France monocentric Cohort	Admission in NICU after surgery	2003/12 - 2004/10	SAH	WFNS 4-5 33%	- Age mean 48 SD 11 - Female 57%	- <2d after onset - evidence of bleeding on CT - aneurysm at angiography	- No surgical or endovascular treatment (n=4) - surgery / coiling > 48h after adm (n=7)	- Predictors: simple imputation by last value (S100B) - Outcome: NA	Unfav outcome (GOS 1-3) at 6 months		74	Unfav outcome: 24 (32%)
Witsch et al. 2016 Ann Neurol [24]		Prospective US monocentric cohort (SHOP)	Admission in ICU	1996/07 - 2014/03	SAH	28% 3-8 10% 9-12 62% 13-15	- Age mean 55.3 SD 14.5 - Female 68%	- Adm < 14d from the onset	- AVM	Predictors: exclusion (n=93) Outcome: multiple Imputation for mRS (n=351) by MCMCM (Little's MCAR test not significant)	Unfav outcome (mRS 4-6) at 12 months (by phone)	- TICS (cognitive status) at 12 months - SIP (QOL - physical) at 12 months	mRS 1526 cog 699 QOL 401	Unfav outcome: 1200 (79%)
Zafar et al. 2017 Neurocrit Care [25]		Retrospective US monocentric cohort	Hosp. database with high grade SAH (\geq HH3F3), recruitment location NA	2011/09 - 2016/02	SAH	mean 10.4 SD 4.7	- Age mean 58.3 SD 14.2 - Female 69%	- aneurysmal SAH - high grade H&H \geq 3		- Predictors: exclusion of variables with >10% missing date (n=22), "imputing for the rest" - Outcome: NA	Mortality at discharge	- Unfav outcome (GOS 1-3) at discharge - functional outcome (GOS 1-2, 3, 4-5) at discharge	153	Mortality: 28 (18%)
Zhao et al. 2017 J Neurosurg [26]		Prospective Chinese multicentric (11) cohort	Poor grade SAH (WFNS IV-V) recruited at the ED	2010/10 - 2012/03	SAH	mean 7.5 SD 2.6	- Age mean 54.6 SD 11.8 - Female 47%	- poor grade aSAH WFNS 4-5 - endovascular treatment	- neurological improvement after resuscitation	NA	Unfav outcome (mRS 4-6) at 12 months		136	Unfav outcome: 64 (47%)
Zheng et al. 2019 Front Neurol [27]		Prospective Chinese Multicentric study	Poor grade aSAH (WFNS IV-V)	2010/10 - 2012/03	aSAH	WFNS V 53.6%	- Age Mean 55 SD 11.6 - Female 50.9%	- aneurysm at angiography / MRI		- Predictors and outcome: exclusion	Unfav outcome (mRS 4-6) at 12 months		324	Unfav outcome: 190 (58.6%)

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Weimer et al. 2016 Crit Care Med [28]		Retrospective analysis on prospective US monocentric cohort	Admission in NICU	2008/08 - 2011/10	SAH 35% SDH 35% IPH 30%	- Died: median 7 (IQR 4-10) discharged: 15 (10-15) - mRS 0-3: 15 (12-15) mRS 4-6: 10 (7-14)	- Age: *Discharge d median 69 (IQR 53-76) *Died: 62 (51-76) - Female 53%	- Aneurysmal or CT-neg SAH, subdural hematoma or Intra-parenchymal hemorrhage - Time of adm NA	- SAH secondary to vascular dissection - vasculopathy - AVM - Other aneurysmal causes	- Predictors: NA - Outcome at 12m: simple imputation with the outcome at 3m (n=53) - Outcome at 3m: exclusion (n=29)	Mortality at discharge	Unfav outcome (mRS 4-6) at 12 months (phone interview by NA)	Mortality: 357 Unfav outcome: 328	- Mortality: 41 (11%) - Unfav outcome: 156 (48%)

S3 Table - Part B. Complete standardized form. Prognostic tools details of the 28 articles about development models.

Publication	Main statistical analysis	Specified candidate predictors	Predictor's selection strategy	Predictors (number)	Landmark time	Public equation?	Global performances	Reporting of discrimination	Reporting of Classification	Reporting of calibration	Comparing with existing score	Internal validation	External validation
Chang et al. 2017 Am J Hypertens [1]	9 tools Logistic regression	Yes (n=11)	Univariate (p<0.001) then multivariate (NA)	(3 or 4): Hematoma volume, NIHSS + depending on the models: mean PP (dich), mean BP (dich), creatinine, IVH	12 hours after admission	No (OR+CI w/o intercept)	No	AUC ROC: cf table 4	No	No	No	No	No
Chuang et al. 2009 Int J Qual Health Care [2] Simplified ICH score	2 tools Logistic regression then points assigned on the strength of association w/ outcome	Yes (n=8)	Univariate <0.1 then multivariate (forward stepwise p<0.05)	Both (5): age, GCS, ATCD HTA, glc, dialysis dependency	First evaluation	- LR: No (OR + CI w/o intercept) - sICH: yes	No	AUC ROC: *LR: 0.91 *sICH: 0.89 (0.84-0.94)	Accuracy. Se. Sp. PPV. NPV. LR+. LR-: cf table 4 (Cut-off: Youden)	HL GOF test: *LR: p=0.55 *sICH: p=0.34 & histogram obs / pred	ICH score ICH-GS - pairwise comparison of ROC curves - McNemar test to compare Se & Sp	10-fold Cross-Validation	No
Di Napoli et al. 2011 Stroke [3]	3 tools Logistic regression	Yes	None : adding biomarkers to the ICH score (Hemphill et al.)	(6) ICH score + glucose or WBC or CRP	Admission	No (OR+CI w/o intercept)	Nagelkerke R ² Glc 68.8 WBC 70.7 CRP 71.8 LR chi ² Glc 174.7 WBC 179.6 CRP 182.2	AUC ROC Glc 0.973 WBC 0.976 CRP 0.978	No	HL GOF test p>0.2	Yes, ICH score - Net benefit decision curve - NRI Glc 3.3% p=0.57 WBC 2.19% p=0.56 CRP 8.14% p=0.6	No	No

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Edwards et al. 1999 Neurology [4]	2 tools - Logistic regression - Artificial neural network	Yes - LR: n=8 - ANN: n=14 Interactions	- LR: univ (p≤0.25) then multivariate p<0.1 backward (clinical predictors) then forward (CT predictors) - ANN: NA	*LR (4): Gender, GCS score ≤8, CT pineal shift, CT hydrocephalus *ANN (14): age, gender, race, MAP, PP, GCS, history of hypertension, history of diabetes, CT hydrocephalus, CT IVH, CT hematoma size, CT hematoma location, CT cisternal effacement, CT pineal shift	Admission	- LR: No (coef+SE w/o intercept) - ANN: No	No	AUC ROC: *LR: 0.919 *ANN: 0.984	Correct classification rate: *LR: 90% survivors. 79% dead *ANN: 100% both (Cut off: arbitrary probability of 0.5)	HL GOF test: *LR: p: 0.439 *ANN: p: 0.995	Tuhrim equation	No	No
Fallenius et al. 2019 Stroke [5]	3 tools – Logistic regression	No	known prognostic factors from the literature and significant variables from univariate analyses	*Clinical (4) age, GCS, severe chronic comorbidity, modified SAPS II *CT (4) brain stem ICH, hematoma volume, midline shift, IVH *Clinical + CT (7) age, GCS, severe chronic comorbidity, modified SAPS II, brain stem ICH, hematoma volume, IVH	24 hours after admission	No (OR+CI w/o intercept)	Nagelkerke R ² *Clinical 0.42 *CT 0.22 *Clinical+CT 0.47	AUC ROC *Clinical 0.83 (0.81-0.86) *CT 0.73 (0.70-0.77) *Clinical + CT 0.85 (0.83-0.88)	No	HL GOF test P>0.05	No	No	No
Godoy et al. 2006 Stroke [6] Modified ICH-score	4 tools - analysis NA	Yes (n=5)	None (change of cut offs and one variable removed from ICH score)	*Model A (5): GCS, ICH volume, presence of IVH (depending on Graeb's score), age, comorbidities *Model B (5): same [diff btw the 2 scores = cut offs of GCS, Graeb's score and age]	72 hours after admission	No	No	Non-param. AUC ROC: *30-Day mortality -A: 0.878 (0.824-0.9931) -B: 0.869 (0.811-0.928) *6-month GOS -A: 0.893 (0.844-0.941) -B: 0.895 (0.847-0.943)	Se. Sp. PPV. cf table 3 (Cut-off: Youden)	No	ICH-score Comparing AUC	No	No

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Ho et al. 2016 SpringerPlus [7]	1 score Logistic regression → Nomogram	Yes (n=9)	Univariate (p<0.05) then forward selection	(6) Age, gender, adm NIHSS, systolic BP, Heart disease history, Creatinine	Admission	No (OR+CI w/o intercept)	No	AUC ROC 0.87	No	- Calibration curve - le Cessie and Houwelingen GOF test (p=0.36)	No	No	No
Jeng et al. 2008 J Neurol Sci [8]	2 tools - Cox regression (mortality) - Logistic regression (func outcome)	Yes (n=22) Interactions tested	Univariate (p<0.1) then multivariate (NA)	(6): age, BMI, NIHS, requiring ventilator aid, ICH volume >=30, ventricular extension	Admission	No (HR/OR +CI w/o intercept)	R ² : *Cox (mortality): 68.2% *LR (func outcome): 64.1%	AUC ROC: *Cox (mortality): 0.961 (0.936- 0.985) *LR (poor outcome): 0.903 (0.866- 0.940)	No	No	No	No	No
Lukic et al. 2012 Acta Neurol Belg [9]	2 tools - Logistic regression - Artificial neural network	Yes (n=8)	- LR: univ (p≤0.20) then multivariate backward (selection NA) - ANN: trial-and- error process	- LR (5): level of consciousness (4 cat), gender, age, pulse BP, verbal GCS - ANN (8): age, gender, pulse BP, mean BP, eye GCS, motor GCS, verbal GCS, level of consciousness	Admission	- LR: No (coef + SE w/o intercept) - ANN: No	No	AUC ROC LR: 0.86 (0.82- 0.89) ANN: 0.94 (0.85-0.99)	ANN on internal validation: True - 90.5% True + 95.1%	HL GOF test LR: p=0.2 ANN: p=0.6	No	Yes for ANN 62 patients (for classificati on only)	No
Maas et al. 2017 Cerebrovasc Dis [10]	1 tools logistic regression	No Interactions tested	backward conditional selection (elimination based on change in the likelihood ratio)	5 Age, premorbid mRS, IVH by day 5, hispanic ethnicity, GCS by day 5	Day 5	No (OR+CI w/o intercept)	Nagelkerke R ² 0.46 -2 log likelihood 148.1	No	PPV 79.1% NPV 87.1% Diagnostic effectiveness 83%	No	Yes (ICH score)	No	No
Sembill et al. 2017 Neurology [11] Max ICH-score	2 tools (logistic regression) → score	No	NA	(6) lobar ICH vol, non-lobar ICH vol, age, NIHSS, IVH, oral anticoag	24 hours after admission	Yes	No	AUC ROC - mRS 12m: 0.81 (0.77- 0.85) - mortality 12m: 0.77 (0.72-0.81)	No	Histogram mRS vs max ICH score	Yes, ICH and MICH score, method by Hanley and McNeil	No	No

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Ziai et al. 2015 Neuro Crit Care [12]	4 tools Logistic regression	Yes (n=6)	univariate ($p \leq 0.1$) then multivariate ($p < 0.2$) backwards stepwise then AIC	*mortality, full (4): 4-pt TIL score, ICH vol, IVH vol, DNR at 24h *mortality, ICH score (3): 3-pt TIL score, ICH score, DNR at 24h *mRS, full (4): 4-pt TIL score, GCS, age, ICH vol *mRS, ICH score (2): 4-pt TIL, ICH score	First 72 hours after admission	No (OR+CI w/o intercept)	No	AUC ROC (on internal validation) *mortality, full: 0.94 *mortality, ICH score: 0.96 *mRS, full: 0.94 *mRS, ICH score: 0.92	No	No	No	3-fold Cross-Validation	No
Celi et al. 2012 J Pers Med [13]	3 tools LR; BN; ANN	Yes (n=13)	correlation based feature subset algorithm	(12): Age, Gly, gly SD, max WBC, INR, min GCS, max GCS, mean GCS, min sBP, min Na, mean Na, SD Na	24 hours after admission	No (estimate coef and SE w/o intercept)	No	*AUC ROC LR 0.945; BN 0.958; ANN 0.868 *Mean absolute error LR 0.158; BN 0.127; ANN 0.168	Accuracy LR 89%; BN 87.7%; ANN 83.6%	HL GOF test (LR only): $p=0.516$	SAPS (factual)	Random Split N=73 No perf reported	No
Claassen et al. 2004 Crit Care Med [14] SAH PDS	1 tool Logistic regression then score based on the weight of each coeff of the LR	Yes (interaction) (n=NA)	univariate then multivariate forward stepwise	(4): arterio-alveolar gradient of >125 mm Hg, HCO ₃ of <20 mmol/L, Glucose of >180 mg/dL, mean arterial pressure of <70 or >130 mm Hg	24 hours after admission	LR: No (OR+CI w/o intercept) Score: yes	No	AUC ROC 0.79 (0.74 – 0.85)	No	Plot	APACHE-II SIRS summary score SAH sum score (comparing AUC)	No	No
Czorlich et al. 2015 Acta Neurochir [15]	1 tool Logistic regression	Yes (n=NA)	univariate ($p < 0.1$) then multivariate forward	(3): SAPS-II, anticoag drugs, headache	24 hours after admission	No (OR+CI w/o intercept)	No	AUC ROC 0.860 (0.786-0.934)	No	No	SAPS-II (comparing AUC)	No	No

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Degos et al. 2012 Anesth [16]	2 tools Logistic regression	Yes (interaction) n=14	univ p<0.2 then multivariate (backward and forward) + interaction	*w/o interaction (9): Intracranial hypertension (IH) on adm, severe IH, isch vasospasm, rebleeding, endovascular complication, surgery complication, Fisher score III-V, admission hydrocephalus, >60y *interaction: same + hydrocephalus*age > 60y	NA (neurologic events recorded during the ICU stay)	No (OR+CI w/o intercept)	No	AUC ROC (dev? IV?) *interaction: 0.85 (0.82-0.88) *w/o interaction: 0.84 (0.82-0.88)	No	HL GOF test (dev? IV?) *interaction : p=0.22 *w/o interaction: p=0.18	No	jackknife bootstrap 100 iterations	No
Degos et al. 2012 Stroke [17] ABC score	3 tools Logistic regression then score based on the weight of each ORs of the LR	Yes (n=9)	uni puis multi stepwise - p - most parsimonious model	(3): troponin I, S100B, GCS	Admission	LR: No (OR+CI w/o intercept) Score: yes	No	AUC ROC *mortality : 0.828 (0.772-0.885) *full recovery 0.83 (0.79-0.88) *independant : 0.82 (0.77-0.88)	No	HL GOF test NA	WFNS score Fisher score - IDI - NRI -risk stratification capacity (supl met)	Temporal 2008-2009 N= 158 mortality : 0.76 (0.67-0.86) Independence : 0.76 (0.67-0.86)	No
Kissoon et al. 2015 J Stroke Cerebrovasc Dis [18]	2 tools Logistic regression	Yes (n=NA)	univariate	*Model 1 (5): positive fluid balance, WFNS, transfusion, glc, cerebral infarction *Model 2 (5): Model 1 + propensity score	End of NICU stay (fluid balance)	No (OR+CI w/o intercept)	No	AUC ROC *1: 0.91 *2: 0.92	No	No	No	No	No
Koneczalla et al. 2016 World Neurosurg [19]	1 tool Logistic regression	Yes (n=3)	univariate then multivariate p<0.05	(3): age <55y, admission WFNS I-III, small ICH	Admission	No (OR+CI w/o intercept)	Nagelkerke R ² 0.267	No	No	No	No	No	No
Schuiling et al. 2005 J Neurol Neurosurg Psychiatry [20]	2 tools Logistic regression	Yes n=5	Univariate p<0.1 then multivariate forward selection	*Model 1 (3): WFNS, age, Hijdra score *Model 2 (4): Model 1 + troponin I	24 hours after admission	No (OR+CI w/o intercept)	No	AUC ROC *w/o troponin 0.86 (0.77 - 0.95) *w/ troponin 0.89 (0.81 - 0.97)	No	No	No	No	No

Publication	Main statistical analysis	Specified candidate predictors	Predictor's selection strategy	Predictors (number)	Landmark time	Public equation?	Global performances	Reporting of discrimination	Reporting of Classification	Reporting of calibration	Comparing with existing score	Internal validation	External validation
Schuiling et al. 2005 Neurosurgery [21]	1 tool Logistic regression	Yes (n= 4)	Univariate then multivariate forward selection p<0.1	(2) WFNS, Hijdra score	24 hours after admission	No (OR+CI w/o intercept)	No	AUC ROC 0.81 (0.73 - 0.88)	No	No	SAPS II (comparing AUC)	No	No
Szklener et al. 2015 BMJ open [22]	1 tool Logistic regression then grading system	Yes (n=5)	univariate then multivariate backward p<0.05	(4): WFNS, age, Fisher scale, leucocytosis	First hours after hospital admission	No (OR+CI w/o intercept)	No	AUC ROC (grading scale only): 0.91	No	HL GOF test (LR only) p=0.9322	No	No	No
Weiss et al. 2006 Anesthesiology [23]	1 tool Logistic regression	Yes (n=6)	Univariate (p<0.2) then multivariate	(3): age, WFNS score, Mean daily S100B>0,4 g/l	8 days after admission	No (OR+CI w/o intercept)	No	AUC ROC 0.88 (0.8-0.96)	No	HL GOF test 0.84	No	No	No
Witsch et al. 2016 Ann Neurol [24] FRESH score	3 tools Linear regression	Yes n=35	mix of knowledge-based and data-driven approaches (BIC k-means)	*FRESH (4): Hunt&Hess, APACHE w/o GCS, age, aneurysmal rebled *FRESH-cog (5): FRESH + education *FRESH-quol (6): FRESH + education + premorbid disabilities	48 hours after admission	Yes	Nagelkerke R ² and Cox/Snell R ² (dev? IV?) *FRESH: 89.8% (88.1-91.6) Nagelkerke R ² 0.50 Cox/Snell R ² 0.35 *FRESH -cog & -quol: NA	AUC ROC (dev? IV?) *FRESH: 89.8% (88.1-91.6) *FRESH-cog: 79.7 (75.2-84.2) *FRESH quol: 78.2 (71.3-85.2)	No	No	HAIR Delong et al method (AUCs)	nonparametric bootstrap using 500 repetitions	CONSCIOUS-1 (52 centres) N= 413 N-R ² 0.2 ; C/S R ² 0.13 AUC ROC: 73.2 (67.3-79.1)
Zafar et al. 2017 Neurocrit Care [25]	3 tools Logistic regression	Yes (n=451)	Multivariate (Lasso penalty and bootstrapping)	*Mortality (3): APACHE II, glucose, ICP *GOS 1-3 (2): Leveciteram - MV *multilevel (NA): max GCS day 1, min GCS day 2-3, APACHE II	72 hours after admission	No	No	AUC ROC for binary models *mortality: 0.9198 *GOS 1-3: 0.9456	No	Yes (multilevel model only): Bar plot	No	Cross validation	No
Zhao et al. 2017 J Neurosurg [26] AMPAS	2 tools Logistic regression	Yes (n=10)	Univariate (p<0.05). backward multivariate selection	*Pre op (4): age, WFNS, Fisher, wider neck aneurysm *Post op (5): pre op + pneumonia	NA *pre-op: median 24h range 0-35 days *post op: "during the ICU stay"	No (OR+CI w/o intercept)	No	AUC ROC *pre op: 0.86 (0.80-0.92) *post op: 0.87 (0.81-0.93)	No	HL GOF test *pre op : p=0.941 *post op : p=0.653	No	No	No

Publication	Main statistical analysis	Specified candidate predictors	Predictor's selection strategy	Predictors (number)	Landmark time	Public equation?	Global performances	Reporting of discrimination	Reporting of Classification	Reporting of calibration	Comparing with existing score	Internal validation	External validation
Zheng et al. 2019 Front Neurol [27]	5 tools: 4 Logistic regressions 1 score (WAP)	Yes (n=22)	backward multivariate selection	- Model 1 (3): age, ventilated y/n, pupil react - Model 2 (3): age, pupil react, GCS - Model 3 (4): age, pupil react, GCS, mFisher - Model 4 (5): age, pupil react, GCS, mFisher, ttt modality - WAP score (3): WFNS, age, pupillary reactivity	3 days	No for the models (OR+CI w/o intercept)	No	AUC ROC - M1: 0.74 (0.69-0.79) - M2: 0.81 (0.76-0.86) - M3: 0.85 (0.81-0.89) - M4: 0.86 (0.82-0.90) - WAP score: 0.77 (0.72-0.82)	No	WAP score only: - HL GOF test p=1.00 - Table obs vs pred	No	No	No
Weimer et al. 2016 Crit Care Med [28]	2 tools Logistic regression	Yes (n=NA)	Multivariate (backward selection on p>0.05)	*Mortality (6): GCS, no surg intervention, vasopressor use, renal failure, hist of CV disease, history of BPCO *mRS (9): age, NIHSS, brainstem herniation, type of bleed, arrhythmia, premorbid mRS, hist of diabetes, hist of cancer, hist of BPCO	NA (some variables recorded during the ICU stay)	Yes	No	C-stat: *Mortality: 0.96 *mRS: 0.92	No	HL GOF test: *Mortality: p=0.98 *mRS: p=0.95	No	No	No

References of the S3 Table

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