Study: first author, year of publication	Data origin: institute, country	Data collection: type, date	Indicators of hemorrhage	Patient number (n)	Age (y) mean ± SD or median [IQR]	Male gender n (%)	HR mean ± SD (PH/AD)	Mortality n, (%)	Main outcome(s)
Bohonek 2019	*Military University Hospital Prague, Czech Republic*	*retrospective, single-center, 2014-2018*	*received blood products (fresh apheresis platelets or cryopreserved platelets)*	*46*	*53 [20–80]; 50 [27–66]**	*32 (69.6)*	*94.8 ± 59.0 (AD)*	*10 (21.7)*	*mortality, blood products administered, adverse effects following platelet transfusion, laboratory parameters such as aPTI*
Boudreau 2019	*University of Cincinnati Medical Center, Cincinnati, Ohio, USA*	*retrospective, single-center, April 2014 – October 2015*	*received blood products and tranexamic acid*	*116*	*45 [24-61]; 33 [23-45]**	*90 (77.6)*	*101.3 ± 43.0 (PH)*	*27 (23.3)*	*mortality, thromboembolic events, transfusion requirements*
Duchesne 2019	11 level I trauma centers, 1 level II trauma center from the USA	retrospective, multi-center, *January 2011 – December 2016*	pelvic fracture with SBP ≤ 90 mmHg and/or HR ≥ 120 bpm and/or BD ≥ 5 mEq	279	40 [28–54]	172 (62.0)	120.6 ± 27.7 (AD)	89 (32.0)	mortality, frequency of each hemorrhage intervention adjunct used, time to definitive bleeding control
Montazer 2019	Imam Khomeini Hospital, Sari, Iran	prospective, single-center, March 2014 – February 2015	multiple trauma with hemodynamic instability (not defined)	400	42 ± 20	333 (83.3)	110.0 ± 14.0 (AD)	67 (16.7)	mortality
Priestley 2019	*LAC+USC Medical Center, LAC+USC blood bank database, University of*	*retrospective, single-center, January 2010 – October 2014*	*received 3 units of pRBC in any 60-minute period within 24 hours of admission and received interventional*	*283*	*34 [24-48]*	*244 (86.2)*	*104.0 ± 24.0 (PH)*	*88 (31.1)*	*mortality, days on ventilator, length of hospitalization*

	Southern California, Los Angeles, CA, USA		*radiology or surgery for definitive hemorrhage control*						
Barmparas 2018	*Cedars-Sinai Medical Center Los Angeles, CA, USA*	*retrospective, single-center January 2011 – October 2016*	*received massive transfusion (defined as 3 units of pRBC within the first hour from admission)*	*120*	*39.0 [27.0-54.8]*	*92 (76.7)*	*101.1 ± 39.7 (AD)*	*59 (49.2)*	*mortality*
Chaochankit 2018	*Songklanagarind Hospital, Hat Yai, Thailand*	*retrospective, single-center, January 2014 – December 2014*	*received massive transfusion, met trauma team activation criteria*	*15*	*35 [22-44.5]*	*13 (86.7)*	*113.0 ± 22.1 (AD)*	*12 (80.0)*	*need for massive transfusion*
Moore 2018	Denver Health Medical Center, Denver, CO, USA	prospective, single-center, April 2014 – March 2017	SBP ≤ 70 mmHg or 71-90 mmHg with HR ≥ 108 bpm	125	33 [25-47]	103 (82.4)	110.0 ± 15.9 (PH)	16 (12.8)	mortality
Ng 2018	British Columbia Trauma Registry, Canada	retrospective, single-center, April 2012 – June 2015	SBP ≤ 90 mmHg and/or HR ≥ 110 bpm	117	43 ± 19	96 (82.0)	112.0 ± 35.0 (AD)	22 (19.0)	meeting the indication criteria for TXA
Guo 2017	33 academic hospitals in 16 Chinese provinces, China	prospective, multi-center, December 2013 – April 2014	new-onset hypotension unexplained by any other cause than hemorrhage (SBP < 90 mmHg, DBP < 60 mmHg, or MAP < 65 mmHg or decreased SBP with more than 40 mmHg from baseline in a hypertensive patient), and signs of tissue hypoperfusion (tachycardia, oliguria, mottled skin, altered mental state)	428	52 ± 18	296 (69.2)	111.3 ± 17.9 (AD)	104 (23.4)	mortality
Heidari 2017	4 level I trauma centers from Iran	prospective, multi-center, April 2015 – September 2015	blunt abdominal trauma with positive FAST	168	38 ± 17	129 (76.8)	105.3 ± 23.4 (AD)	57 (33.9)	positive FAST, mortality

Luehr 2017	*Mercy Hospital-Springfield, Springfield, MO, USA*	*retrospective, single-center, 2013 - 2016*	*received blood products and tranexamic acid*	*115*	*42 ± 18*	*78 (67.8)*	*133.3 ± 21.4 (PH)*	*20 (17.4)*	*mortality*
Naumann 2017	*University Hospitals Birmingham NHS Foundation Trust, Birmingham, UK*	*retrospective, single-center, July 2015 – January 2017*	*received blood products, required intensive care and had a lactate value >2 mmol/l (cohort B**)*	*17*	*40 ± 18*	*16 (94.0)*	*108.0 ± 16.2 (AD)*	*3 (17.6)*	*mortality, thromboembolic events, hospital-free and ICU-free days (calculated as 30 minus the number of days in hospital and ICU respectively)*
Savage 2017	*Indiana University School of Medicine, Indianapolis IN, USA; The University of Tennessee Health Science Center, Memphis, TN, USA*	*retrospective, multi-center, September 2013 – May 2015*	*received at least one unit of pRBC within the first 24 hours of admission*	*330*	*35 [25-54]*	*251 (76.0)*	*108.2 ± 55.3 (AD)*	*82 (24.8)*	*mortality*
Day 2016	*The Queen's Medical Center, Honolulu, Hawaii, USA*	*retrospective, single-center, September 2011 – March 2013*	*received at least one unit of pRBC in the first 6 hours, met trauma team activation criteria*	*116*	*no data*	*no data*	*98.0 ± 24.0 (PH)*	*13 (11.0)*	*multiple transfusions*
Ordoñez 2016	Fundación Valle del Lili, University Hospital, Cali, Colombia	retrospective, single-center, January 2012 – December 2013	ISS > 15 with hemodynamic instability (SBP < 100 mmHg and/or HR > 100 bpm and/or the need for at least 4 units of packed red blood cells in the trauma bay)	171	32 ± 14	154 (90.0)	112.6 ± 23.5 (AD)	26 (15.2)	mortality
Shah 2015	Aga Khan University Hospital, Karachi, Pakistan	retrospective, single-center, January 2011 – December 2012	isolated abdominal gunshot wound	70	35 ± 11	68 (97.1)	99.8 ± 30.3 (AD)	11 (15.7)	mortality, complications

Thurston 2015	Trauma Center, Groote Schuur Hospital and Faculty of Health Sciences, University of Cape Town, South Africa	prospective, single-center, September 2013 – November 2013	SBP < 90 mmHg and/or HR >110 bpm at any time from admission to 3 hours after injury	50	32 ± 13	47 (94.0)	123.3 ± 13.1 (AD)	11 (22.0)	mortality
Sisak 2013	*John Hunter Hospital and University of Newcastle, Newcastle, NSW, Australia*	*prospective, single-center, January 2010 – January 2011*	*received blood products within the first 24 hours from admission*	*91*	*38 [22–59]*	*68 (74.7)*	*100.0 ± 30.1 (AD)*	*13 (14.0)*	*mortality, need for emergent surgery, ICU admission, length of ICU-and hospital stay*

Table S2. Detailed description of the characteristics of the included studies. Most papers enrolled trauma patients receiving blood products and/or showing signs of hemodynamic instability. Hemodynamic instability was defined by vital parameters in most cases. Most of the data was collected retrospectively. The number of participants in each dataset ranged from 15 to 428. There is a significant heterogeneity in mortality between datasets. The need for massive transfusion is accompanied by a prominently high mortality rate. A mean heart rate (HR) > 120 bpm does not entail an outstanding mortality rate.
*the study population was divided into two groups, median [IQR] age values were provided separately for the groups
**only cohort B consisted of trauma patients with active bleeding
SD=standard deviation, IQR=interquartile range, aPTI=activated partial thromboplastin time, ICU=intensive care unit, PH=prehospital, AD=upon admission, pRBC=packed red blood cells, RCT=randomized controlled trial, SBP=systolic blood pressure, DBP=diastolic blood pressure, MAP=mean arterial pressure, ISS=injury severity score, HR=heart rate, bpm=beats per minute, BD=base deficit, FAST=focused assessment with sonography for trauma, TXA=tranexamic acid