### Supplemental material 1: search strategies

Search date: 2020/09/25

## A. Embase

- #1. 'intensive care unit'/exp OR ((intensive OR critical) NEAR/1 care OR ICU OR ITU OR (close-attention OR intensive-treatment OR intensive-therapy) NEAR/1 unit\*):ab,ti,kw
- #2. 'anemia'/exp OR (anemia OR anaemia):ab,ti,kw
- #3. #1 AND #2 7432
- #4. 'clinical study'/de OR 'case control study'/de OR 'family study'/de OR 'longitudinal study'/de OR 'retrospective study'/de OR 'cohort analysis'/de OR ('prospective study'/de NOT 'randomized controlled trials'/de) OR ((cohort OR case-control OR follow-up OR observational OR epidemiologic\* OR cross-sectional) NEAR/1 (study OR studies)):ab,ti,kw
- #5. #3 AND #4 1878

### **B.** PubMed

- #1. "Intensive Care Units"[Mesh] OR "Critical Care"[Mesh] OR "intensive care"[Title/Abstract] OR "critical care"[Title/Abstract] OR ICU[Title/Abstract] OR ITU[Title/Abstract] OR "close attention unit"[Title/Abstract] OR "intensive treatment unit"[Title/Abstract] OR "intensive therapy unit"[Title/Abstract] OR "close attention units" or "intensive treatment units"[Title/Abstract] OR "intensive therapy units"[Title/Abstract] OR "close attention units" or "intensive treatment units"[Title/Abstract] OR "intensive therapy units"[Title/Abstract] OR "close attention units" or "intensive treatment units"[Title/Abstract] OR "intensive therapy units"[Title/Abstract]
- #2. "Anemia"[Mesh] OR Anemia[Title/Abstract] OR anaemia[Title/Abstract]
- #3. #1 AND #2 2046
- #4. "Case-control studies"[MeSH Terms] OR "Cohort studies"[MeSH Terms] OR "Case control\*"[Text Word] OR "cohort study"[Text Word] OR "cohort studies"[Text Word] OR "cohort analysis"[Text Word] OR "cohort analyses"[Text Word] OR "observational study"[Text Word] OR "observational studies"[Text Word] OR retrospective[Text Word] OR "cross-sectional"[Text Word] or "cross sectional"[Text Word] OR prospective[Text Word] OR "Cross-sectional studies"[Mesh]

#5. #3 AND #4 882

## C. Web of Science

#1. TS=((intensive or critical) near/1 care OR ICU OR ITU OR ("close attention" or "intensive treatment" or "intensive therapy") near/1 unit\*)

- #2. TS=(anemia or anaemia)
- #3. #1 AND #2 1957
- #4. TS=((clinical OR "case control" OR family OR longitudinal OR retrospective OR prospective OR cohort OR "follow up" OR "follow-up"
  OR observational OR epidemiological OR "cross sectional" or "cross-sectional") near/1 (study or studies))
- #5. #3 AND #4 597

Supplemental table S1: Characteristics of included papers.
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Study	Study	Sam	Diagnosis	Inclusion	Age	Male/	Outcome	Duration	Risk	Definition of
ID	design	ple		Criteria	(years	female	category	of	Factors	<b>Risk Factors</b>
		size			old)			follow-up		
Alves	Case	84	The diagnosis at	All patients	73	34/50	Death	NR	Anemia	Hemoglobin
2010	control		ICU admission	older than 60	(60-89				measured	<13 g/dL for
	study		were post-surgery,	years-old	)				at	men and <12
			stroke, neoplasm,	admitted to the					admission	g/dL for
			septic shock,	ICU from					and during	women.

			Hypovolemic	January to					hospital	
			shock, Respiratory	December					stay	
			failure,	2007 were						
			Cardiogenic shock	included.						
			and other.							
Ameloo	Cohort	82	NR	All comatose	63±13	57/25	Good	180 days	Hemoglobi	An arterial
t 2015	study			survivors after			neurologica	post-cardia	n	blood gas with
				non-traumatic			l outcome;	c arrest		determination
				cardiac arrest			Death			of hemoglobin
				treated in our						was taken
				tertiary care						hourly during
				hospital are						the 24 h
				prospectively						hypothermia
				enrolled.						period.
										Hemoglobin
										values were
										divided in

quartiles.

da Silva	Cohort	128	Acute renal failure	All patients	49.5±	79/49	All-cause	$17 \pm 15$	Hemoglobi	Continuous
2006	study			who presented	20.6		mortality	days	n	variable
				acute renal						
				failure during						
				ICU stay.						
Ergan	Cohort	106	COPD	All	71(62-	83/23	Hospital	NR	Anemia	Hemoglobin
2016	study			consecutive	76)		mortality;		Hemoglobi	levels,12
				COPD			Noninvasiv		n levels	gm/dL for

				exacerbation			e			female patients
				patients who			ventilation			and ,13 gm/dL
				developed			failure;			for male
				acute			Long-term			patients
				respiratory			survival			according to the
				failure.						World Health
										Organization
										(WHO) anemia
										definition
Gadren	Cohort	1107	COPD	All patients	64±	544/	90 –day	90 days	Anemia	Hemoglobin
2017	study			with COPD	12.7	563	mortality;		Hemoglobi	levels<12 g/dL
				having acute			overall		n levels	at ICU
				respiratory			mortality			admission.
				failure due to						
				any cause						
				admitted to the						
				medical ICU						

Hamilto	Cohort	140	Severe burns	Patients with	$26 \pm$	130/5	Hospital	30 days	Anemia	Hemoglobin at
n 2015	study			thermal	6.4		days ICU			the time of
				injuries with a			days;			theater
				total body			Ventilation			evacuation<10
				surface area			days;			g/dL.
				burn of greater			Sepsis;			
				than 20% or			Acute			
				with inhalation			respiratory			
				injury.			distress			
							syndrome;			
							Ventilator-			
							associated			
							pneumonia;			
							Renal			
							failure;			
							Mortality			
Han	Cohort	2145	Cardiovascular	Patients were	67.5±	1281/	Acute	The first 15	Anemia	Hemoglobin

2015	study	disease, Sepsis,	admitted to the	15.88	864	kidney	days of the		level <10.5
		Surgical	ICU during the			injury;	ICU		g/dL
		emergency,	period of the			Early acute	admission.		
		Underlying	study.			kidney			
		chronic kidney				injury; Late			
		disease, Diabetes				acute			
		mellitus,				kidney			
		Non-hematologic				injury;			
		malignancy,				Non-recove			
		Hematologic				red AKI;			
		malignancy,				All-cause			
		Previously				mortality;			
		diagnosed anemia,				Length of			
		Bleeding.				hospital			
						stay			
Ittyache	Cohort 70	COPD	COPD with	NR	61/9	All-cause	6 days	Anemia	hemoglobin:
n 2016	study		supporting			mortality			males <13 g %

				spirometry or a						and females <
				high probabilit						2 g %).
				y of the disease						
				(on the basis o						
				f clinical histor						
				y, history of						
				chronic exposu						
				re to respirator						
				y irritants, smo						
				king history, p						
				hysical examin						
				ation, and ches						
				t radiograph)						
Kopteri	Cohort 1	26	Cancer	Adult patient	65.35±	76/50	All-cause	Median	Anemia	Hemoglobin
les	study			(>18 years old)	14.42		mortality	(IQR): 6		level $< 10$
2011				with a				(4-16) days		g/dL
				pathologically						

				proven cancer						
				who required						
				ICU						
				admission.						
Kristof	Cohort	435	Sepsis	General	62±15	278/	Death	90 days	Anemia	NR
2018	study			surgical ICU		157			requiring	
				patients with					red blood	
				sepsis					cell	
				excluding					transfusion	
				cardiac surgery						
				patients						
Kurtz	Cohort	34	Severe brain injury	Severe brain	52	11/23	Brain	NR	Hemoglobi	divided into 4
2010	study		caused by	injury caused	(27–		tissue		n ranges	group:
			subarachnoid	by	84)		hypoxia			≤9,9.1-10,1.1-1
			hemorrhage	subarachnoid						1, >11g/dL
				hemorrhage						
				that underwent						

		multimodality
		neuromonitorin
		g of
		intracranial
		pressure (ICP),
		cerebral micro
		dialysis, and
		PbtO2 as part
		of their clinical
		care.
Lee	Cohort 6500 Trauma	All patients PRE:4 2288/4 Mortality 6 years Anemia NR
2015	study	admitted to the 2 212
		ICU setting years;
		following EARL
		initial trauma Y: 52
		evaluation and years;
		resuscitation, MAT

				and had to	URE:					
				have an ICU	62					
				length of stay	years;					
				$(LOS) \ge 1 day$						
Lee	Cohort	362	peritonitis	Patients who	64.1±	212/13	In-hospital	NR	Anemia	Hemoglobin
2016	study		postoperatively	underwent	14.4	7	mortality			<10g/dL, bot
				emergency GI						preoperative
				surgery for						and
				peritonitis						postoperative
Lipsic	Cohort	1769	Acute myocardial	Peak creatinine	62.2±	1293/	All-cause	30 days	Anemia	Hemoglobin
2005	study		infarction	kinase (CK)	0.3	476	mortality			$\leq 10 \text{ g/dl}$
				plasma levels						
				above 500 IU/l						
				during the first						
				96 h of						
				hospitalization						

Moham	Case	900	ICU patients	All patients	54.7±	504/	Developme	6 months	Anemia	Hemoglobin<10
madi	control			who admitted	8.2	396	nt of acute	after		g/Dl
2018	study			to the ICU			kidney	hospital		
				with a length			injury	discharge		
				of stay greater						
				than 48 h.						
Mora	Case	1252	Traumatically	Traumatically	hemog	1233/	Incidence	30 days	Anemia	Both two
2014	control		injured	injured	lobin	19	of			criterions:
	study			subjects with a	>8.0		complicatio			hemoglobin<8
				recorded	g/dL		ns			g/dL and 7 g/dL
				pre-flight	group:		Mortality			were analysed.
				hemoglobin	24		Hospitalize			
				value were	(21-2		d Return to			
				enrolled.	9);		duty			
					hemog		Incidence			
					lobin≤		of infection			
					8.0		Incidence			

					g/dL		of patients			
					group:		at 30 days			
					25		receiving			
					(22-2		inpatient			
					9)		care			
Mukho	Case	1563	Sepsis	Patients (≥18	NR	957/60	Mortality	52 months	Hemoglobi	NR
padhya	control		(Pulmonary,	years) who		6	following		n	
y 2014	study		Others)	were admitted			hospital			
			Organ-specifc	to ICU from			discharge			
			disease(Hepatic,N	January 2008						
			eurological,Renal,	to April 2010.						
			Cardiovascular,En							
			docrine,Pulmonary							
			)							
			Malignancy							
			(Hematological,							
			Nonhematological)							

			Others							
Oral	Case	186	Pneumonia	Patients with	Total:	104/82	Unfavorabl	30 days	Anemia	NR
2016	control			pneumonia	63.7±		e outcome		(Hgb≤9	
	study			hospitalized in	20.5				g/dl) and	
				intensive care					simultaneo	
				unit.					us brain	
									hypoxia	
									(PbtO2<	
									20 mmHg)	
Okoye	Cohort	812	Traumatic brain	Included	48±23	633/17	Overall	7 years	Hemoglobi	Three ways of
2013	study		injury	patients had a		9	mortality		n, g/dL	grouping:
				history of head			Hospital			$\leq$ 8g/dL and $>$
				trauma and an			length of			8g/dL
				intracranial			stay			(Non-anemic);
				abnormality on			Intensive			$\leq$ 9g/dL and $>$
				initial head			care unit			9g/dL
				computed			length of			(Non-anemic);

			tomography.			stay			$\leq 10 \text{g/dL}$ and
						Acute renal			> 10 g/dL
						failure,			(Non-anemic).
						Acute			
						respiratory			
						distress			
						syndrome,			
						Sepsis			
						during their			
						hospital			
						stay			
Park	Cohort 51	Solid cancer	Solid cancer	65	38/13	Intensive	NR	Anemia	Anemia was
2013	study	patients with acute	patients with	(25-87		care unit			defined as a
		respiratory failure	acute	)		mortality			hemoglobin
			respiratory						level less than
			failure						12g/dL.
			requiring						

				invasive						
				mechanical						
				ventilation and						
				who had						
				received						
				ambulatory						
				chemotherapy						
				within 1 month						
				of ICU						
				admission						
				were included.						
Powell	Case	210	Acute kidney	Meet the	70	142/68	Progression	NR	Hemoglobi	Continuous
2016	control		injury	criteria for	(57–		from acute		n, g/L	variable
	study			acute kidney	77)		kidney			
				injury stage I			injury I to			
				within 12			acute			
				hours.			kidney			

# injury III

Rasmus	Cohort	222	Chronic	All patients	NR	100/	30-day	30 days	Anemia	Three levels of
sen	study		obstructive	older than 35		122	mortality	after		hemoglobin
2011			pulmonary disease	years admitted			90-day	intensive		were defined:
				for the first			mortality	care unit		anemia:
				time to our				admission		hemoglobin $<$
				intensive care						7.4mmol/L (<
				unit with acute						12.0g/dL);
				respiratory						normal:
				failure and						7.4-9.3mmol/L
				requiring						(12.0-15.0g/dL)
				invasive						; high: >9.3

				1 • 1						1/T
				mechanical						mmol/L
				ventilation						(15.0g/dL).
				were identifed						
				in the database.						
Salim	Case	1150	Blunt traumatic	All patients	40±21	859/	Hospital	NR	Anemia	Anemia was
2008	control		brain injury	with serial		291	stay			defined as a
	study			hemoglobin			(including			hemoglobin
				measurements			deaths)			level of less
				were included			Hospital			than 9 g/dL fo
				in the study.			stay			3 consecutive
							(excluding			measurements
							deaths)			
							ICU stay			
							(including			
							deaths)			
							Mortality			
							Complicati			

							ons			
Simoes	Case	308	Cancer patients	Patients were	59.7±	139/	Mortality	30 days	Preoperativ	Preoperative
2018	control		undergoing	included if	14.1	169	Major		e anemia	anemia was
	study		elective abdominal	they met all the			complicatio			defined as
			surgery	following			ns			hemoglobin
				criteria:			Health			lower than
				1. Age greater			Related			12g/dL.
				than 18 years;			Quality of			
				2. Diagnosis of			Life 30			
				a solid			days after			
				neoplasm, plan			surgery			
				for elective			ICU length			
				open			of stay			
				abdominal			Hospital			
				surgery with			length of			
				curative intent			stay			
				or bowel						

				reconstruction						
				from previous						
				primary tumor						
				excision;						
				3. Written						
				informed						
				consent.						
Tavazzi	Cohort	2807	Acute heart failure	NR	73±11	1698/	In-hospital	NR	Anemia	According to
2006	study					1109	all-cause			the World
							mortality			Health
										Organization
										criteria, a
										hemoglobin
										concentration
										<13g/dL in
										men and $<$
										12g/dL in

										women
Uscinsk	Cohort	392	Critically ill	Critically ill	70±	223/	In-hospital	NR	Anemia	Anemia was
a 2015	study		cardiac patients	cardiac	13.8	169	mortality		Hemoglobi	defined
				patients who					n total	according to the
				prospectively						criteria of the
				admitted to an						World Health
				intensive						Organization
				cardiac care						(WHO), i.e. Hb
				unit.						level<12 g/dL
										in women and
										<13 g/dL in
										men.
Wang	Cohort	40	Mechanically	1. Invasive	78.5±	23/17	Length of	NR	Anemia	Anemia was
2012	study		ventilated patients	mechanical	9.4		ICU stay			defined as Hb
			(Acute	ventilation			Length of			level<100g/L.
			exacerbation of	time $>$ 72h;			hospital			
			COPD,	2. Hemoglobin			stay			

			pneumonia, septic	≥100g/L			ICU			
			shock, acute left	before			Mortality			
			heart failure and	admission to			Hospital			
			others which need	intensive care			Mortality			
			Mechanical	unit;						
			ventilation.)	3. Patients who						
				are more than						
				18 years old.						
Younge	Cohort	5304	Acute coronary	All patients 18	61±12	3872/	30-day	20 years	Anemia	Anemia was
2012	study		syndrome	years of age		1432	mortality			defined as
				admitted with a			20-year			hemoglobin $<$
				first admission			mortality			13g/dL for men
				for						and $<12g/dL$
				ST-segment						for women.
				elevation						
				myocardial						
				infarction or						

non-ST-segme
nt elevation
myocardial
infarction.

# Supplemental table S2: Risk of bias assessment

Study	Risk of bias	Study participants	Study attrition	Prognostic factor measurement	Outcome assessment	Study confounding	Statistical analysis and reporting
Alves 2010	High	High	Low	Low	Low	Low	High
Ameloot 2015	High	High	Low	High	High	Low	Low
da Silva 2006	High	High	Low	High	Low	High	High
Ergan 2016	High	High	Low	Low	Low	Low	Low
Gadre 2017	High	High	Low	Moderate	Low	Low	Low

Hamilton 2015	High	High	Low	Moderate	Moderate	Low	Low
Han 2015	High	Low	Low	High	Low	Low	Low
Ittyachen 2016	High	High	Moderate	Low	Low	Low	Low
Kopterides 2011	High	High	Moderate	Moderate	Low	Low	Low
Kristof 2018	High	High	Low	Low	Low	Low	Low
Kurtz 2010	High	High	Moderate	High	Low	Low	Low
Lee 2015	High	Low	Low	High	Low	High	High
Lee 2016	High	High	Low	High	Low	Low	Low
Lipsic 2005	High	High	Low	High	Low	Low	Low
Mohammadi 2018	High	Low	Low	High	Low	Low	Low
Mora 2014	High	High	Low	High	High	High	High
Mukhopadhyay 2014	High	Low	Low	High	Low	Low	Low
Ocal 2016	High	High	Low	Moderate	Low	Low	Low

Okoye 2013	High	High	Low	Moderate	Low	Low	Low
Park 2013	High	High	Low	Low	Low	Low	Low
Powell 2016	High	High	Low	High	Low	Low	Low
Rasmussen 2011	High	High	Low	Low	Low	Low	Low
Salim 2008	High	High	Low	Low	Low	Low	Low
Simoes 2018	High	High	Low	Low	Low	Low	Low
Tavazzi 2006	High	High	Low	Low	Low	Low	Low
Uscinska 2015	High	High	Low	Moderate	Low	High	High
Wang 2012	High	Moderate	Low	Moderate	Low	High	High
Younge 2012	High	High	Low	Moderate	Low	Low	Low

Stu	dy or Subgroup la	og[Odds Ratio]	SE	Weight I	Odds Ratio V, Random, 95% CI		dds Ratio ndom, 95% CI	
6.1. Alve Sub Het	1 mixed is 2010 total (95% CI) erogeneity: Not appli t for overall effect: Z	1.2413 (		100.0% 100.0%	3.46 [1.29, 9.28] 3.46 [1.29, 9.28]		*	
da S Sub Hete	2 acute kidney inju iilva 2006 total (95% CI) erogeneity: Not appli t for overall effect: Z	0.7621 (		100.0% 100.0%	2.14 [1.00, 4.61] 2.14 [1.00, 4.61]		*	
Erga Gad	3 COPD an 2016 re 2017 total (95% CI) erogeneity: Tau <sup>2</sup> = 0 t for overall effect: Z	1.1494 0.1732 ( .36; Chi <sup>2</sup> = 4.19, = 1.20 (P = 0.23)	.1696	41.1% 58.9% 100.0% P = 0.04);	3.16 [1.32, 7.57] 1.19 [0.85, 1.66] 1.78 [0.69, 4.55] 1 <sup>2</sup> = 76%		•	
Kop Park Sub Het	4 cancer terides 2011 ; 2013 total (95% CI) erogeneity: Tau <sup>2</sup> = 0 t for overall effect: Z	.30: Chi <sup>2</sup> = 2.01.	f = 1(	59.8% 40.2% 100.0% P = 0.16);	11.11 [4.84, 25.49] 3.72 [1.06, 13.13] 7.16 [2.50, 20.45] <sup>2</sup> = 50%		-	-
Lee Sub Het	5 trauma 2015 total (95% CI) erogeneity: Not appli t for overall effect: Z	0.5481 ( icable = 3.09 (P = 0.00)		100.0% 100.0%	1.73 [1.22, 2.45] 1.73 [1.22, 2.45]			
Lips Usc Sub	6 critically ill cardia ic 2005 inska 2015 total (95% CI) erogeneity: Tau <sup>2</sup> = 0 t for overall effect: Z	0.984 ( 0.9933	0.2263	52.1% 47.9% 100.0%	2.68 [1.72, 4.17] 2.70 [1.70, 4.29] 2.69 [1.95, 3.70]		ŧ	
Lee Sub	7 peritonitis 2016 total (95% CI) erogeneity: Not appli t for overall effect: Z	1.026 ( icable = 3.40 (P = 0.00)		100.0% 100.0%	2.79 [1.55, 5.04] 2.79 [1.55, 5.04]		1	
Kris Sub	8 sepsis tof 2018 total (95% CI) erogeneity: Not appli t for overall effect: Z	0.7562 ( icable = 3.02 (P = 0.00)	0.2501 2)	100.0% 100.0%	2.13 [1.30, 3.48] 2.13 [1.30, 3.48]		<b>‡</b>	
Tes	t for subgroup differ	ences: Chi <sup>2</sup> = 9.4	8, df = 1	7 (P = 0.22	), I <sup>2</sup> = 25.8%	0.01 0.1 non-aner	1 10 mia anemia	100
в					Odds Ratio	Od	ds Ratio	
5	Study or Subgroup 6.2.1 mixed Han 2015 Subtotal (95% CI)	log[Odds Ratio]	SE	Weight	IV. Random, 95% CI			
	Subtotal (95% CI) Heterogeneity: Not a Test for overall effect	0.5822 pplicable : Z = 6.45 (P < 0.00	0.0903	100.0%	1.79 [1.50, 2.14] 1.79 [1.50, 2.14]		•	
	Subtotal (95% CI) Heterogeneily: Not a Test for overall effect 6.2.2 cancer Kopterides 2011 Subtotal (95% CI) Heterogeneily: Not a Test for overall effect	pplicable : Z = 6.45 (P < 0.00 1.4012	001) 0.581	100.0% 100.0% 100.0%	1.79 [1.50, 2.14] 1.79 [1.50, 2.14] 4.06 [1.30, 12.68] 4.06 [1.30, 12.68]		<b>.</b>	
	Heterogeneity: Not a Test for overall effect 6.2.2 cancer Kopterides 2011 Subtotal (95% CI)	pplicable ; Z = 6,45 (P < 0.00 1.4012 pplicable ; Z = 2,41 (P = 0.02 -0.5108 -0.0202	0.581 0.581 0.3945 0.3332	100.0% 100.0% 41.6% 58.4%	4.06 [1.30, 12.68] 4.06 [1.30, 12.68] 0.60 [0.28, 1.30] 0.98 [0.51, 1.88]	_		
	Heterogeneity: Not ay Test for overall effect 6.2.2 cancer Kopterides 2011 Subtotal (05% CI) Heterogeneity: Not ay Cast for overall effect 6.2.3 brain injury Okoye 2013 Subtotal (05% CI) Heterogeneity: Tau* Test for overall effect	pplicable : Z = 6.45 (P = 0.00 1.4012 pplicable : Z = 2.41 (P = 0.02 -0.5108 -0.0202 = 0.00; CHP = 0.90, : Z = 0.68 (P = 0.38	0.581 0.581 0.3945 0.3333 df= 1 (f	100.0% 100.0% 41.6% 58.4% 100.0% P = 0.34); P	4.06 [1.30, 12.68] 4.06 [1.30, 12.68] 0.60 [0.28, 1.30] 0.98 [0.51, 1.88] 0.80 [0.49, 1.32] = 0%		Tanemia 10	100
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**Supplemental Figure S1.** Forest Plots Representing Anemia and All-Cause Mortality. univariate OR, subgrouped by diagnoses (A); multivariate OR, subgrouped by diagnoses (B); univariate HR, subgrouped by diagnoses (C); multivariate HR, subgrouped by diagnoses (D); OR, odds ratio; HR, hazard ratio.

۸					Odds Ratio	Odds Ratio
A	Study or Subgroup	log[Odds Ratio]	SE	Weight	IV, Random, 95% Cl	IV, Random, 95% CI
	1.9.3 Univariate	0.4700	0.4600	C 4 00V	1 10 10 05 1 001	-
	Gadre 2017	0.1732		64.8%	1.19 [0.85, 1.66]	
	Park 2013 Subtotal (95% CI)	1.3146	0.0429	35.2% 100.0%	3.72 [1.06, 13.13] 1.78 [0.61, 5.18]	
	Heterogeneity: Tau <sup>2</sup> =	0.42-068-2.05	df = 1 /D			
	Test for overall effect		ui = 1 (r	= 0.03), r	- 00%	
	1.9.4 Multivariate Kopterides 2011	1.4012	0.581	100.0% 100.0%	4.06 (1.30, 12.68)	1
	Subtotal (95% CI) Heterogeneity: Not ap			100.0%	4.06 [1.30, 12.68]	
	Test for overall effect	Z = 2.41 (P = 0.02)				
						0.01 0.1 1 10 100
	Test for subaroup dif	ferences: Chi <sup>a</sup> = 1.0	7. df = 1	(P = 0.30	). P= 6.9%	non-anemia anemia
B					Odds Ratio	Odds Ratio
D	Study or Subgroup	log[Odds Ratio]	SE	Weight	IV, Random, 95% CI	IV, Random, 95% CI
	6.4.1 COPD					
	Gadre 2017	0.1732	0.1696	64.8%	1.19 [0.85, 1.66]	
	Subtotal (95% CI)			64.8%	1.19 [0.85, 1.66]	*
	Heterogeneity: Not a	oplicable				
	Test for overall effect					
	6.4.3 cancer					
	Park 2013	1.3146	0.6429	35.2%	3.72 [1.06, 13.13]	
	Subtotal (95% CI)			35.2%	3.72 [1.06, 13.13]	
	Heterogeneity: Not a	oplicable				
	Test for overall effect					
	Tetel (05k Cl)			100.05	4 70 10 24 7 400	
	Total (95% CI)	0.10.052-0.05		100.0%	1.78 [0.61, 5.18]	
	Heterogeneity: Tau <sup>2</sup> =			= 0.09); P	= 66%	0.01 0.1 1 10 100
	Test for overall effect			/D - 0.00	1 12-00 100	non-anemia anemia
~	Test for subaroup dif	ierences. Unit = 2.5	1 = 10.01	UP = 0.09	0.1% Odds Ratio	Odds Ratio
C	Study or Subgroup	log[Odds Ratio]	SE	Weight	IV, Random, 95% CI	IV. Random, 95% CI
	1.7.1 Univariate					
	Ergan 2016	1.1494	0.446	14.8%	3.16 [1.32, 7.57]	
	Gadre 2017 Lee 2016		0.1672 0.3015	22.1% 18.7%	1.32 [0.95, 1.84] 2.79 [1.55, 5.04]	
	Uscinska 2015	0.9933	0.236	20.5%	2.79 [1.55, 5.04]	-
	Subtotal (95% CI)	0.0000	0.200	76.1%	2.22 [1.39, 3.56]	•
	Heterogeneity: Tau <sup>2</sup> = Test for overall effect	= 0.15; Chi <sup>2</sup> = 9.83, Z = 3.32 (P = 0.00)	df = 3 (P 39)	= 0.02); P	= 69%	
	1.7.2 Multivariate					
	Tavazzi 2006	+0.1132	0.0441	23.9%	0.89 [0.82, 0.97]	1
	Subtotal (95% CI)			23.9%	0.89 [0.82, 0.97]	•
	Heterogeneity: Not a Test for overall effect					
	Total (95% CI)			100.0%	1.82 [1.06, 3.14]	•
	Heterogeneity: Tau* =					0.01 0.1 1 10 100
	Test for overall effect	Z = 2.17 (P = 0.03)				non-anemia anemia
-	Test for subaroup dif	ferences: Chi <sup>2</sup> = 13	.89. df =	1 (P = 0.0	002). P = 92.8% Odds Ratio	Odds Ratio
D	Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Random, 95% CI	Odds Ratio IV, Random, 95% Cl
	6.5.1 COPD Ergan 2016	1,1494	0.446	16.5%	3.16 (1.32, 7.57)	
	Gadre 2017		0.1672	32.0%	1.32 [0.95, 1.84]	
	Subtotal (95% CI) Heterogeneity: Tau*:	0.25 Ch#= 2.22	at - 1 /2	48.5%	1.85 [0.81, 4.25]	-
	Test for overall effect	Z = 1.45 (P = 0.15)	01=1 (P	= 0.07), (	= 70%	
	6.5.2 critically ill car					
	Uscinska 2015 Subtotal (95% CI)	0.9933	0.236	27.8%	2.70 [1.70, 4.29] 2.70 [1.70, 4.29]	-
	Heterogeneity: Not a Test for overall effect	pplicable Z = 4.21 (P < 0.00)	011	81.03	2110 [1110, 4.29]	
	6.5.7 peritonitis					
	Lee 2016	1.026	0.3015	23.8%	2 79 [1.55, 5.04]	1
	Subtotal (95% CI) Heterogeneity: Not a	pplicable		23.8%	2.79 [1.55, 5.04]	-
	Test for overall effect	z = 3.40 (P = 0.00)	37)			
	Total (95% CI) Heterogeneity: Tau <sup>a</sup> :	0.15: Chi#= 9.83	df = 3 (P	100.0% = 0.02); P	2.22 [1.39, 3.56] = 69%	<b>•</b>
	Test for overall effect	Z = 3.32 (P = 0.00)	39)			0.01 0.1 1 10 100 non-anemia anemia
	Test for subaroup dif	rerences: Chi# = 0.1	2. af = 2	t# = 0.70	1. I" = U%	

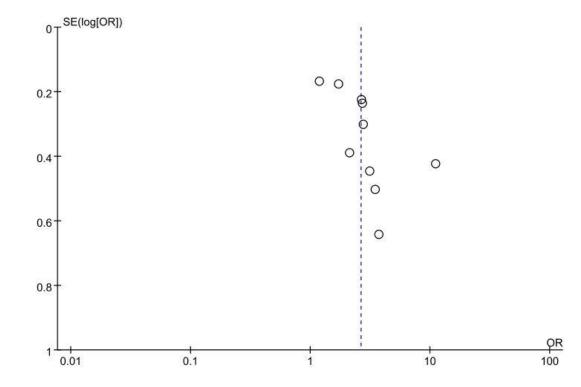
**Supplemental Figure S2.** Forest Plots Representing Anemia and Hospital/ICU Mortality. Odds ratios for anemia measured at admission and ICU mortality (A); anemia and ICU mortality, subgrouped by diagnoses (B); anemia and hospital mortality (C); anemia and hospital mortality, subgrouped by diagnoses (D).

Study ID	Sample size	<b>Risk factor</b>	Outcome	Result data
				MD: 6.00, 95%
Hamilton 2015	140	Anemia	Ventilation days	
				CI (-0.98, 12.98)
Hamilton 2015				MD 1.02,95%
	952	Anemia	ICU days	
				CI (-8.59, 10.63)
				MD 14.7, 95%
Okoye 2013	812	Anemia	Hospital days	
				CI (-8.0, 37.40)
D 11 2017	210	<b>A</b> .	Progression from acute kidney injury I to acute	OR:1.40, 95%
Powell 2016	210	Anemia	kidney injury III	CI (0.69, 2.83)
				OR:2.43, 95%
Han 2015	2145	Anemia	Acute kidney injury (univariate)	
				CI (1.92, 3.07)

Supplemental table S3: Study of anemia on admission and other complications

	0145	· ·		HR:1.76, 95%
Han 2015	2145	Anemia	Acute kidney injury (multivariate)	
				CI (1.35, 2.30)
				OR:1.70, 95%
Mohammadi 2018	900	Anemia	Acute kidney injury (6 month after-multivariate)	
				CI (0.97, 2.98)
				OR:1.86, 95%
Han 2015	2145	Anemia	Early acute kidney injury (univariate)	
				CI (1.53-2.27)
				HR:1.42, 95%
Han 2015	2145	Anemia	Early acute kidney injury (multivariate)	
				CI (1.13-1.79)
				OR:2.53, 95%
Han 2015	2145	Anemia	Late acute kidney injury (univariate)	
				CI (1.73-3.70)
				HR: 1.83, 95%
Han 2015	2145	Anemia	Late acute kidney injury (multivariate)	
				CI (1.19-2.82)
				OR: 1.91, 95%
Han 2015	2145	Anemia	Non-recovered acute kidney injury(univariate)	
				CI (1.54, 2.37)
				HR: 1.64, 95%
Han 2015	2145	Anemia	Non-recovered acute kidney injury (multivariate)	
				CI (1.30, 2.08)
V : ( CO010	425	<b>,</b> ·		MD 8.0, 95%
Kristof 2018	435	Anemia	ICU days	

				CI (5.93-10.07)
				MD 1.0, 95%
Kristof 2018	435	Anemia	Days without mechanical ventilation	
				CI (0.04-1.96)
				MD 1.0, 95%
Kristof 2018	435	Anemia	Days without vasopressors	
				CI (-0.49-2.49)
				MD -1.0, 95%
Kristof 2018	435	Anemia	Days without renal replacement therapy	
				CI (-2.77-0.77)
				OR: 3.80, 95%
Kurtz 2010	34	Anemia	Acute kidney injury (univariate)	
				CI (1.50, 9.63)
				OR: 1.80, 95%
Mora 2014	1252	Anemia	Complications within 30 days (multivariate)	
				CI (0.92, 3.51)
				OR: 1.74, 95%
Salim 2008	1150	Anemia	Complications within 7.5 years (multivariate)	
				CI (1.14, 2.65)
				OR: 1.30, 95%
Okoye 2013	812	Anemia	Acute respiratory distress (multivariate)	
				CI (0.23, 7.50)
				OR: 0.80, 95%
Okoye 2013	812	Anemia	Sepsis	
				CI (0.17, 3.70)



Supplemental Figure S3. Publication bias test: Funnel plot for all-cause mortality.