Appendix 4 (as supplied by the authors): Characteristics of included studies

Table 1: Characteristics of included studies for COVID-19 with ARDS

Table 2: Characteristics of included randomized controlled trials for ARDS

Table 3 Characteristics of included studies for COVID-19

Table 4: Characteristics of included studies for SARS

Table 5: Characteristics of included studies for MERS

Table 6: Characteristics of included studies for influenza

Table 7: Characteristics of included randomized controlled trials for CAP

Table 1 Characteristics of included studies for COVID-19 with ARDS

Study	Country, region and hospital	Study design	Population	Intervention	Adjustment	Outcomes
Wu 2020	Jinyintan Hospital, Wuhan, China	Retrospective cohort study	Patients with COVID-19 pneumonia with ARDS: according to WHO criteria	Methylprednisolone (n=50) No steroids (n=34)	Cox regression analysis	Mortality

ARDS=acute respiratory distress syndrome; WHO=World Health Organization.

Table 2 Characteristics of included randomized controlled trials for ARDS

Study/year (country) (reference	Setting/ inclusion criteria	Patient characteristics	Disease severity scores	CS Group N	Non-CS group N	Corticosteroid therapy dose /timing/duration	Outcomes reported
Steinberg, 2006 (USA)	25 hospitals of the National Heart, Lung, and Blood Institute (NHLBI) ARDS Clinical Trials Network Intubated and receiving mechanical ventilation; 7 to 28 days after onset of ARDS; on day of study entry PaO2/FiO2 had to be < 200 mmHg	Persistent Acute Respiratory Distress Syndrome	APACHE III score mean 87.6 sd 27.5 placebo mean 84.6 sd 29.4	89	91	Methylprednisolone sodium succinate diluted in 50 mL of 5% dextrose in water; single IV dose of 2 mg/kg of PBW; followed by 0.5 mg/kg of PBW every 6 hours for 14 days; then dose of 0.5 mg/kg of PBW every 12 hours for 7 days, then tapering of dose	Mortality Length of ICU Length of hospital stay Duration of mechanical ventilation Neuromuscular weakness Superinfection
Meduri, 2007 (USA)	5 ICUs Adult intubated patients receiving mechanical ventilation; meeting criteria for ARDS according to AECC (Bernard 1994) within 72 hours	Early ARDS	APACHE III score mean 60.2 sd 20.2 placebo mean 57.9 sd 21.0	63	28	Methylprednisolone;mixed in 240 mL of normal saline and administered daily as an infusion at 10 mL/hour; loading dose of 1 mg/kg, followed by infusion of 1 mg/kg/day from day 1 to day 14; 0.5 mg/kg/day on days 15 to day 21; 0.25 mg/kg/day on days 22 to day 25; then 0.125 mg/kg/day from	Mortality Length of ICU Length of hospital stay Duration of mechanical ventilation Serious hyperglycemia Neuromuscular weakness Superinfection

Study	Setting and population					Intervention	Outcomes
Liu, 2012 (China)	ICU of Zhongda Hospital Affiliated to Southeast University Adults from 18 to 80 years of age; fulfils criteria of ARDS according to the AECC (Bernard 1994); ARDS diagnosis within 3 days of admission; fulfils CIRCI diagnosis according to Society of Critical Care Medicine of PLAs Guidelines 2006	Early ARDS plus critical illness related corticosteroid insufficiency	APACHE II score mean 20.7 (sd 6.4) mean 21.4 (sd 7.16)	12	14	Stress dose glucocorticoid; hydrocortisone 100 mg IV 3 times a day for 7 days	Mortality Length of ICU
Rezk, 2013 (Kuwait)	ICU of Farwaneya Hospital Kuwait Patients diagnosed with ARDS; mechanically ventilated; start of treatment in first 48 hours	Early ARDS	NR	18	9	Methylprednisolone mixed in 240 mL normal saline; administered daily at infusion of 10 mL/ hour; loading dose of 1 mg/kg followed by infusion of 1 mg/kg/day on days 1 to 14, 0.5 mg/kg/day from day 15 to day 21, 0.25 mg/kg/day from day 22 to day 25, 0.125 mg/kg/day from day 26 to day 28	Mortality Duration of mechanical ventilation
Zhao, 2014 (China)	ICU of Songjiang hospital of shanghai Criteria of ARDS according to AECC (Bernard 1994)	ARDS	NR	24	29	Budesonide plus conventional treatment; inhaled budesonide 2 mg twice a day for 12 days alongside ARDS management algorithm according	Mortality Length of hospital stay Duration of mechanical ventilation Gastrointestinal bleeding

						to the 2006 Chinese Society for Critical Care Medicine Guidelines	Superinfection
Tongyoo, 2016 (Thailand)	ICU of Siriraj Hospital, Bangkok Adults > 18 years of age; with severe sepsis or septic shock; receiving mechanical ventilation for hypoxaemic respiratory failure; within 12 hours of study entry; meeting the diagnostic criteria for ALI/ARDS according to the AECC definition (Bernard 1994)	Early sepsis associated ARDS	APACHE II score mean 21.7, sd 5.7; placebo mean 21.9, sd5.7	98	99	Hydrocortisone; IV bolus, 50 mg in 10 mL of normal saline, every 6 hours for 7 days	Mortality Duration of mechanical ventilation Serious hyperglycemia Gastrointestinal bleeding Superinfection
Villar, 2020 (Spain)	17 ICUs Eligible patients were aged 18 years or older; intubated and mechanically ventilated; had acute onset of ARDS, as defined by the American- European Consensus Conference criteria for ARDS,11 or by the Berlin criteria as moderate-to-severe ARDS,12 which includes having an initiating clinical condition	Moderate-to-severe ARDS	Moderate (100 <PaO2/FiO2 ≤200) 239/277 Severe (PaO2/FiO2 ≤100) 38/277	139	138	Dexamethasone plus conventional treatment; Patients in the dexamethasone group received an intravenous dose of 20 mg once daily from day 1 to day 5, which was reduced to 10 mg once daily from day 6 to day 10.Treatment with dexamethasone was maintained for a maximum of 10 days after randomisation or until extubation (if occurring before day 10).	Mortality Duration of mechanical ventilation Serious hyperglycemia Superinfection

(eg, pneumonia, aspiration, inhalation injury,
sepsis,
trauma, or acute pancreatitis) within 1 week of the
known clinical insult, or new or worsening
respiratory
symptoms; bilateral pulmonary
infiltrates on chest
imaging (x-ray or CT scan); absence of left atrial
hypertension, pulmonary capillary wedge pressure
of
less than 18 mm Hg, or no clinical signs of left
heart
failure; and hypoxaemia, as defined by a ratio
between
partial pressure of oxygen in arterial blood and
fraction
of inspired oxygen (PaO2/FiO2) of 200 mm Hg or
less on
positive end-expiratory pressure (PEEP) of 5 cm
H2O or
more, regardless of FiO2.

ALI=Acute lung injury; ARDS=Acute Respiratory Distress Syndrome; PBW=Predicted Body Weight; ICU=Intensive care unit; IV=Intravenous; AECC=American-European Consensus Conference; CS=Corticosteroid; CIRCI=critical illness-related corticosteroid insufficiency.

Table 3 Characteristics of included studies for COVID-19

Study	Country, region and hospital	Study design	Population	Intervention	Adjustment	Outcomes
Li 2020 (n=269)	Tongji Hospital, Wuhan, China	Retrospective cohort study	Severe COVID-19 patients. Diagnosed based on the WHO interim guidance and Chinese COVID-19 guideline.	Steroid (n=196) No steroid (n=73)	Multivariable Cox proportional hazards regression analysis	Mortality
Lu 2020 (n=62)	Tongji hospital, Wuhan, China	Retrospective cohort study	ICU patients with confirmed SARS-CoV-2 infection	Steroid (n=31) No steroid (n=31)	Propensity score matching analysis	Mortality
Wang 2020 (n=115)	Third People's Hospital of Hubei, China	Retrospective cohort study	Patients with confirmed SARS-CoV-2 infection (mixed severity)	Steroid (n=73) No steroid (n=42)	Multivariable logistic regression analysis	Mortality or intensive care unit (ICU) admission
Xu 2020 (n=113)	First Affiliated Hospital of Zhejiang University, Shenzhen Third People's Hospital,	Retrospective cohort study	Patients with confirmed SARS-CoV-2 infection (mixed severity)	Steroid (n=64) No steroid (n=49)	Multivariable logistic regression analysis	Duration of SARS-CoV-2 Virus RNA detection

	China				
Yan 2020 (n=120)	NO.3 People's hospital of Hubei, China	Retrospective cohort study	Patients with laboratory-confirmed SARS-CoV-2 infection (mixed severity)	Steroid (n=54) No steroid (n=66)	Multivariable logistic regression analysis	Prolonged viral shedding

ARDS=acute respiratory distress syndrome; WHO=World Health Organization.

Table 4 Characteristics of included studies for SARS

Study	Country, region and hospital	Study design	Population	Intervention	Adjustment	Outcomes
Lau 2009 (n=1743)	Hong Kong	Retrospective cohort study	Probable SARS patients: according to the WHO criteria.	Steroid (n=51) No steroid (n=751) Without ribavirin	Multinomial logistic regression	Case fatality
Lee 2004 (n=17)	Two regional hospitals in Hong Kong	Randomized controlled trial	Probable SARS, with or without laboratory confirmation according to the CDC criteria	Early (<7 days of illness) intravenous hydrocortisone 100 mg every 8 hourly (n=9) Normal saline (n=7)	NA	Median time for SARS-CoV RNA to become undetectable in plasma Plasma SARS-CoV RNA concentrations in the second and third week of illness
Long 2016 (n=5327)	Mainland China	Retrospective cohort study	Clinically diagnosed SARS: according to the CDC criteria. Case definitions were as follows: 1) fever (temperature >38 °C); 2) chest radiograph showed evidence of consolidation with or without respiratory symptoms; 3) history of exposure to an index case suspected of having SARS or direct contact with a person who fell ill following exposure to the index case. Severe SARS cases: according to the criteria of Health Ministry of China, with one of the following: 1) breathing of more than 30/min; 2) oxygen partial pressure of more than 70 mmHg; 3) blood oxygen saturation of less than 93%; 4) sternum score of greater than or equal to 2 points.	Steroid (n=NR) No steroid (n=NR)	Multivariate Cox's proportional hazard regression model	Mortality

SARS=severe acute respiratory syndrome; WHO=World Health Organization; CoV=coronavirus; NA=not applicable; CDC=Center for Disease Control and Prevention; RNA=Ribonucleic Acid; NR=not

reported.

Table 5 Characteristics of included studies for MERS

Study	Country, region and hospital	Study design	Population	Intervention	Adjustment	Outcomes
Alfaraj 2019 (n=314)	Prince Mohammed bin Abdulaziz Hospital, Saudi Arabia	Retrospective cohort study	Symptomatic MERS-CoV confirmed patients. All infections were confirmed using real time RT-PCR of respiratory samples.	Steroid (n=NR) No steroid (n=NR)	Logistic regression analysis	Mortality
Arabi 2018 (n=309)	Fourteen Saudi Arabian tertiary care hospitals	Retrospective cohort study	ICU patients with MERS	Steroid (n=151) No steroid (n=158)	Multivariable logistic regression analysis Cox proportional hazards model Marginal structural model	90-day all cause mortality MERS-CoV RNA Clearance Time to MERS-CoV RNA clearance

MERS-CoV=middle east respiratory syndrome coronavirus; PT-PCR=positive reverse transcriptase polymerase chain reaction; NR=not reported; ICU=intensive care unit; RNA=Ribonucleic Acid.

Table 6 Characteristics of included studies for influenza

Study	Country, region and hospital	Study design	Population	Intervention		Adjustment	Outcomes
				Steroid	No steroid		
Al-Busaidi 2016 (n=68)	Oman	Single centre, retrospective cohort	In-hospital patients Median age (years): 23 (range 25 days to 67 years)	11	57	Multivariable regression analysis	Length of stay
Balaganesakumar 2013 (n=1302)	India	Multicentre, prospective cohort study	In-hospital/admissions with influenza Median age (years): 26 (1 to 82)	70	210	Multiple logistic regression analysis	Mortality
Boudreault 2011 (n=143)	USA	Single-centre, retrospective cohort	Non-ICU/HCT recipients with RTI Median age (years): no CS 42 (32 to 51); low-dose CS 42 (28 to 53); high-dose CS 40 (32 to 54)	80 (low-dose 43 and high-dose 37)	63	Cox proportional hazards analysis	MV, time to death
Brun-Buisson 2011 (n=208)	France	Multicentre, retrospective analysis of prospectively collected data	ICU/severe respiratory failure (ARDS or MV) Median age (years): no CS 45 (35 to 55); CS 49 (34 to 56) Immunosuppression: no CS 18.4%; CS 21.7%	83 (early CS 50 and late CS 33)	125	Cox proportional hazards regression analysis	Hospital mortality, length of ICU stay, adverse events
Cao 2016 (n=288)	China	Multicentre, retrospective cohort study	In-hospital patients ≥ 14 years with pneumonia Median age (years): 58 (IQR 45 to 68)	204	84	Cox proportional hazards regression analysis	Mortality, adverse events, viral shedding
Chawla 2013 (n=77)	India	Single-centre, retrospective	ICU/admissions with influenza Mean age (years): 40.9 (± 13.4)	38	39	NA	Mortality

		cohort study					
Delaney 2016 (n=607)	Canada	Multicentre, prospective cohort study	ICU/age ≥ 18 years; critically ill with confirmed, probable or highly suspected influenza Mean age (years): no CS 46.2 (± 15.2); CS 48.8 (± 15.3) Asthma: CS 29.3%; no CS 12.8%; P = < 0.001 COPD: CS 25.0%; no CS 9.2%; P = < 0.001 Immunosuppressed: CS 8.9%; no CS 3.1%; P = 0.002	280	327	Multivariable logistic regression analysis	Mortality, hospital-acquired infections
Delgado-Rodriguez 2012 (n=813)	Spain	Multicentre, prospective cohort	In-hospital/ILI, RTI, septic shock, multi-organ failure Cohort median age (years): 41 (19 to 55)	31	782	Multivariate logistic regression analysis	Poor outcome (ICU admission and in-hospital death), LOS
Han 2011 (n=83)	China-Shenyang City	Multicentre, retrospective cohort	In-hospital/age > 3 years Median age (years): no CS 38 (5 to 75); CS 43 (3 to 70)	46 (early CS 17 and late CS 29)	37	Cox proportional hazards regression analysis	Critical illness
Huang 2017 (n=86)	Taiwan	Single-centre, retrospective cohort study	In-hospital/ age > 18 years Cohort mean age (years): 65.9 (± 19.2) Chronic pulmonary disease: respiratory distress cohort 27.1%	29	19	Multivariable Logistic regression analysis	Mortality
Jain 2009 (n=272, CS data available for 239)	USA	Multicentre, retrospective cohort	In-hospital/ILI with hospital admission ≥ 24 hours Cohort median age: 21 years (21 days to 86 years) Asthma: 28%; COPD: 8% Immunosuppression: 15%	86	153	NA	Death/ICU admission versus survival/no ICU admission
Kim 2011 (n=245)	South Korea	Multicentre, retrospective	ICU/age ≥ 15 years; presence of critical illness	107	138	Multivariable Logistic regression analysis	Mortality (14-day, 30-day and 90-day), LOS, acquired

| | | cohort/case-control | Mean age (years): no CS 54.1 (± 19.3); CS 56.9 (± 17.2)

Asthma: CS 9%; no CS 7%

COPD: CS 13%; no CS 4% | | | | infections |
|---|---|---|---|---|---|---|---|
| Kinikar 2012 (n=92) | India | Single centre, retrospective cohort study | ICU/admissions with influenza < 12 years

Cohort median age (years): 2.5 (1.3 to 6)

Asthma: 4.3%

Congenital heart disease: 6.5% | 21 | 71 | NA | In-hospital mortality |
| Kudo 2012 (n=89) | Japan | Single-centre, retrospective cohort | In-hospital/hospitalised patients with respiratory disorders

Cohort median age (years): 8 (0 to 71)

Asthma: 29.2% | 46 | 12 | NA | LOS |
| Lee 2015 (n=2649) | China | Multicentre, retrospective analysis of prospectively collected data | In-hospital/age > 17 years
Cohort median age (years): 63 (42 to 79) | 610 | 2039 | Multivariable regression analysis | Mortality, bacterial superinfection, LOS |
| Li 2012 (n=46) | China-Anhui province | Multicentre, retrospective cohort study | In-hospital/pregnant, severe disease
Median age (years): adults who died 21 (18 to 31) and survivors 21 (18 to 27) | 27 | 19 | NA | Mortality |

Li 2017 (n=2141)	China	Multicentre, retrospective analysis of prospectively collected data	In-hospital with viral pneumonia > 14 years Median age (years): no CS 33.7 (24.6 to 48.7); CS 35.0 (23.8 to 52.4) Asthma: no CS 1.5%; CS 2.1% COPD: no CS 4.3%; CS 5.6% Immunosuppression: no CS 1.4%; CS 3.2%	1055	1086	Cox proportional hazards regression analysis	Mortality, ICU admission, hospital-acquired infection, MV
Liem 2009 (n=67)	Vietnam	Multicentre, retrospective cohort	In-hospital/hospitalised patients with influenza Cohort median age (years): 25 (16 to 42)	29	38	NA	In-hospital mortality
Linko 2011 (n=132)	Finland	Multicentre, prospective cohort study	ICU/admissions with influenza Median age (years): no CS 44 (25 to 57); CS 51 (40 to 56) COPD: no CS 5%; CS 8% Other obstructive pulmonary disease: no CS 23%; CS 21%	72	60	Multivariable logistic regression analysis	In-hospital mortality, MV, LOS
Mady 2012 (86)	Saudi Arabia	Single-centre, retrospective cohort study	ICU/influenza with respiratory failure Cohort mean age (years): 40.8 Asthma or COPD: 38.3%	43	43	NA	Mortality

Study	Country	Design	Population / Setting	CS	No CS	Analysis	Outcome
Moreno 2018 (n=1846)	Spain	Multicentre, prospective cohort study	ICU/viral pneumonia Median age (years): CS 53 (41 to 62); no CS 51 (39 to 61)	604	1242	Cox proportional hazards regression analysis	ICU mortality
Ono 2016 (n=88054)	Japan	Multicentre retrospective cohort study	Medical insurance database, < 65 years, first episode of hospitalisation with confirmed influenza All < 65 years. Asthma: hospitalised 39.5%; non-hospitalised 23.5% COPD: hospitalised 2.9%; non-hospitalised 0.5% Immunosuppression: hospitalised 0.36%; non-hospitalised 0.13%	804	87250	Cox proportional hazards regression analysis	Rate of hospitalisation
Patel 2013 (n=63)	India-Gujarat	Single-centre, retrospective cohort study	In-hospital/admissions with influenza Cohort median age (years): 34 (3 to 69)	39	24	NA	Mortality
Sertogullarindan 2011 (n=20)	Turkey	Single-centre, prospective cohort study	ICU/severe community-acquired pneumonia and influenza Cohort median age (years): 36 (15 to 72) COPD: 10%	7	13	NA	Mortality
Sheu 2017 (n=192)	Taiwan	Multicentre, retrospective cohort study	ICU admissions with confirmed influenza Cohort mean age (years): 58.3	101	91	NA	Mortality

Viasus 2011 (n=197)	Spain	Multicentre, prospective cohort study	In-hospital/ non-immunosuppressed, admitted > 24 hours Median age (years): no CS 35 (28 to 47); CS 44 (36 to 53) Chronic pulmonary disease: no CS 17.1%; CS 45.9%	37	129	NA	Severe disease (composite outcome of ICU admission/death), acquired infection
Wirz 2016 (n=785)	Switzerland	Multicentre RCT of adjunct prednisone therapy versus placebo in community-acquired pneumonia	Non-ICU with community-acquired pneumonia (influenza subgroup n = 24) All trial participants: mean age (years): CS arm 70.3 (± 17.5); placebo arm 69.0 (± 17) COPD: CS arm 19.3%; placebo 15.4%	11	13		Any-cause mortality at 30 d, hospital readmission at 30 days post discharge, time to effective hospital discharge, time to clinical stability
Wu 2012 (n=206)	Taiwan	Single-centre, prospective cohort	Mixed cohort of out-patients and in-patients Age >= 65 years in cohort: 12.6% Chronic lung disease: 9.7% Malignancy: 8.7%	17	189	Multivariable logistic regression analysis	Complicated influenza (requiring hospitalisation)
Xi 2010 (n=155)	China-Beijing	Multicentre, retrospective	In-hospital/age ≥ 18 years	52	103	Multivariable logistic regression analysis	In-hospital mortality Subgroup analysis of

							mortality by CS dose
		cohort study	Cohort mean age (years): 43 (±18.6)				
			COPD: 6.5%				
Yu 2011 (n=128)	China-Zhengzhou	Multicentre, retrospective cohort study	Not defined Cohort mean age (years): females 28.5 (± 16.4); males 28.5 (± 20.4) Range 8 months to 79 years	54	74	Multivariable logistic regression analysis	Mortality
Tsai 2020 (n=241)	Taiwan	Multicentre prospective cohort	ICU/Influenza with ARDS Cohort median age 60 (51 to 66) 63.5% male Malignancy12%, diabetes 28.6%	Not reported (85 for sensitivity analysis)	Not reported (156 for sensitivity analysis)	Multivariable logistic regression analysis	Mortality, bacteremia

ARDS=acute respiratory distress syndrome; CS=corticosteroid; HCT=hematopoietic cell transplant; ICU=intensive care unit; IQR=interquartile range; LOS=length of stay; MV=mechanical ventilation; PVS=prolonged viral shedding; RTI=respiratory tract infection.

Table 7 Characteristics of included randomized controlled trials for CAP

Study/year (country) (reference	Setting/ inclusion criteria	Patient characteristics	Disease severity scores	CS Group N	Non-CS group N	Corticosteroid therapy dose /timing/duration	Outcomes reported
Wagner, 1956 (US)	Not specified Culture-confirmed pneumococcal pneumonia	Not specified	Not specified	52	61	Hydrocortisone 80–100 mg oral every 6 h tapering dose over 5 days.	Mortality
McHardy, 1972 (Australia)	City Hospital, Edinburgh Age ≥12 y, clinical diagnosis of pneumonia	Inpatient adults and children (aged > 12 years) with pneumonia	Severe (physician judgment), 20/126	40	86	Prednisolone 20 mg daily for 7 days	Mortality
Marik, 1993 (South africa)	ICU of Baragwanath Hospital and Department of Clinical and Experimental Pharmacology (Dr. Havlik), University of the Witwatersrand Age ≥18 and ≤70 y, BTS criteria for severe CAP	Inpatient adults with severe CAP	APACHE II and Lung Injury Score	14	16	Hydrocortisone dose IV 10 mg/kg, 30 minutes prior to starting antibiotic therapy,1 dose;during hospitalisation in ICU	Mortality Length of ICU Need for mechanical ventilation
Confalonieri, 2005 (italy)	ICU or f Respiratory Intermediate Unit (RICU) Ospedale di Trieste, Ospedale Gradenigo (Torino), Ospedale Molinette (Torino),	Inpatient adults with severe community-	American Thoracic	23	23	Hydrocortisone IV 200 mg loading bolus followed by an infusion (hydrocortisone 240 mg in 500	Mortality Length of ICU Length of hospital stay

	Setting	Population	Criteria			Intervention	Outcomes
	Arcispedale S. Anna (Ferrara), Ospedale di Crema, or Ospedale di Paderno Dugnano (Milano). CAP with 1993 ATS criteria severe; Major criteria included (1) requirement of mechanical ventilation; (2) increase in the size of opacities on chest radiograph of 50% or more at 48 hours; (3) requirement of vasopressors for more than 4 hours; or (4) serum creatinine 2 or more mg/dl.	acquired pneumonia	Society criterion for severe pneumonia			cmh 0.9% saline) at a rate of 10 mg/hour; duration 7ds	Need for mechanical ventilation Duration of mechanical ventilation Gastrointestinal bleeding Superinfection
El-Ghamrawy, 2006 (Saudi Arabia)	Not reported Age ≥18 y, severe CAP by ATS criteria requiring ICU admission	Age ≥18 years old with severe CAP	ATS 2001	17	17	Hydrocortisone IV 200 mg bolus followed by maintenance IV dose 240 mg in 500 mL 0.9% saline at a rate of 10 mg/kg/hour	Mortality Length ICU stay Length of hospital stay Duration of mechanical ventilation Gastrointestinal bleeding Superinfection
Mikami, 2007 (Japan)	Kanto Central Hospital (community general hospital),	Inpatient adults with community-	PORT	15	16	Prednisolone IV 40 mg x 1/d; duration 3 days	Length of hospital stay Serious hyperglycemia. Neuropsychiatric events

	Any CAP, non-severe by ATS criteria	acquired pneumonia					Superinfection
Snijders, 2010 (Netherlands)	Medical Centre Alkmaar, a 900-bed teaching hospital Age ≥18 y hospitalized with CAP	Inpatient adults with CAP	Pneumonia Severity Index	104	109	Prednisolone IV or PO 40 mg x 1/d; duration 7 days	Mortality Length of hospital stay Serious hyperglycemia Neuropsychiatric events Superinfection
Fernández-Serrano, 2011 (Spain)	Hospital Universitari de Bellvitge, a 900-bed hospital in Barcelona, Spain Age ≥18 and ≤75 y, severe CAP with consolidation of ≥ 2 lobes and Po2/FIo2 < 300 mmHg	Inpatient adults with CAP	Fine Score	23	22	Methylprednisolone IV 200 mg bolus followed by maintenance IV dose (20 mg/6 hour); duration 10 days	Mortality
Meijvis, 2011 (Netherlands)	2 centers; 880-bed St Antonius Hospital in Nieuwegein and the 00-bed Gelderse Vallei Hospital inEde in the Netherlands Age ≥18 y, CAP by PSI criteria	Inpatient adults with CAP	Pneumonia severity index	151	153	Dexamethasone IV 5 mg x 1/d; duration 4 days	Mortality Length ICU stay Length of hospital stay Serious hyperglycemia Superinfection
Sabry, 2011 (Egypt)	3 centers; Cairo University, and the National Institute of Chest Diseases, and Intensive Care Unit of Ain-Shams Hospital, Ain- Shams University. Adults with ATS criteria for severe CAP	Inpatient adults with severe CAP	ATS 1998	40	40	Hydrocortisone IV (loading dose of 200 mg, followed by 12.5 mg/h); duration 7 days.	Mortality Duration of mechanical ventilation Gastrointestinal bleeding

| Nafae, 2013 (Egypt) | Chest Department, Respiratory Intensive Care Unit, General Medicine Department and General Medicine Intensive Care Unit of the Zagazig University Hospitals

Age ≥18 y, Patients with clinical and radiographic evidence of CAP (pneumonia diagnosed by clinical signs and symptoms: cough with or without sputum, fever> 38.5, dyspnea, pleuritic chest pain or abnormal breath sounds, and radiographic pulmonary abnormalities that are at least segmental and are not due to preexisting or other known causes) which was acquired at the community or within the first 48 h of hospitalization | Inpatient adults with community-acquired pneumonia | Pneumonia Severity Index | 60 | 20 | Hydrocortisone IV 200 mg bolus followed by maintenance IV dose of 10 mg/hour; duration 7 days | Mortality
Length ICU stay
Length of hospital stay
Need for mechanical ventilation
Duration of mechanical ventilation
Serious hyperglycemia
Gastrointestinal bleeding |
| Blum, 2015 (Switzerland) | 7 centers

Age ≥18 y, hospital admission with CAP defined by a new infiltrate on chest radiograph and the presence of at least one of the following acute respiratory signs and symptoms: cough, sputum production, dyspnoea, core body temperature | Inpatient adults with CAP | Pneumonia Severity Index | 392 | 393 | Prednisone PO 50 mg x 1/d; duration 7 days | Mortality
Length ICU stay
Length of hospital stay
Need for mechanical ventilation
Serious hyperglycemia
Gastrointestinal bleeding |

	of 38·0°C or higher, auscultatory findings of abnormal breathing sounds or rales, leucocyte count higher than 10 000 cells per μL or less than 4000 cells per μL.15						Neuropsychiatric events Superinfection
Torres, 2015 (Spain)	3 centers Age ≥18 y with severe CAP by ATS or PSI criteria and serum CRP level >150 mg/L	Inpatient adults with CAP	PSI, AST	61	59	Methylprednisolone IV 0.5 mg/kg in bolus x 2/d; 5 days	Mortality Length ICU stay Length of hospital stay Need for mechanical ventilation Serious hyperglycemia Gastrointestinal bleeding Neuropsychiatric events Superinfection
Gang, 2016 (China)	China-Japan Friendship Hospital Criteria of Respiratory Disease Branch of Chinese medical association	Inpatient adults with severe CAP and Septic shock	Criteria of Respiratory Disease Branch of Chinese medical association	29	29	Methylprednisolone sodium succinate 80 mg daily, duration 7 days; plus Antibacterial drugs	Mortality Length of hospital stay Duration of mechanical ventilation Serious hyperglycemia

CS=Corticosteroid; CAP=Community acquired pneumonia; ATS=American Thoracic Society; BTS=British Thoracic Society; PSI=Pneumonia Severity Index; PO=Oral administration; CRP=C-Reactive protein; IV=Intravenous.