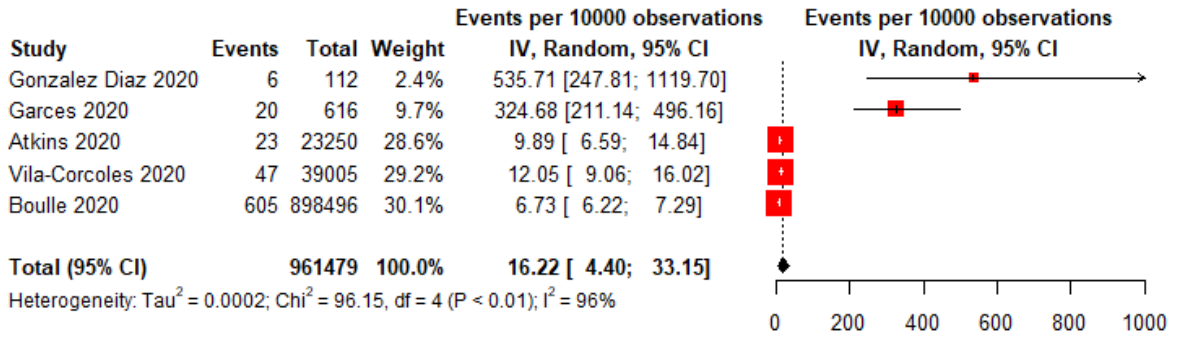
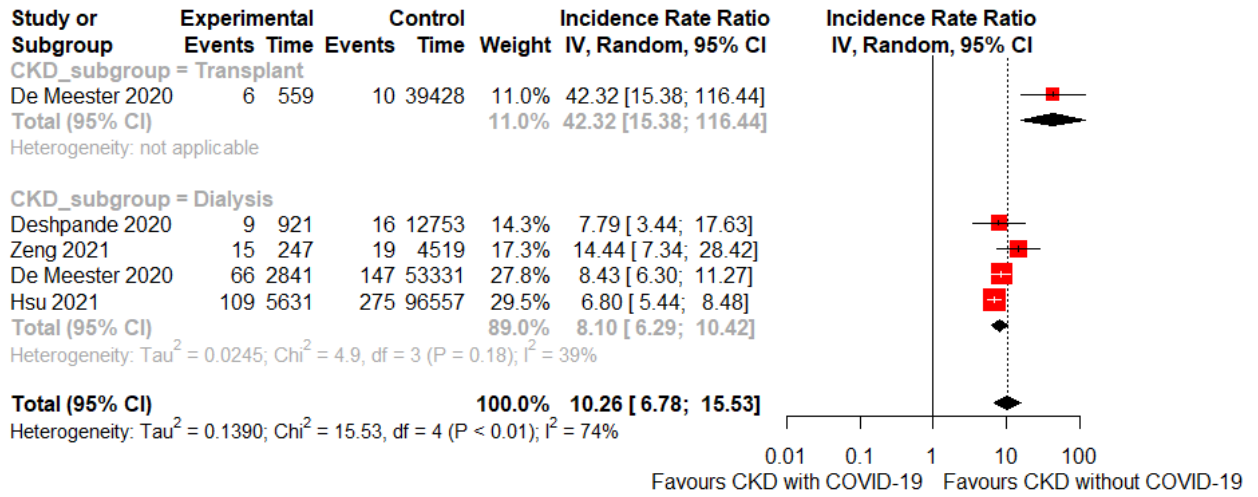


**Figure S1.** Forest plot of the incidence of COVID-19 in people with CKD without kidney replacement therapy.



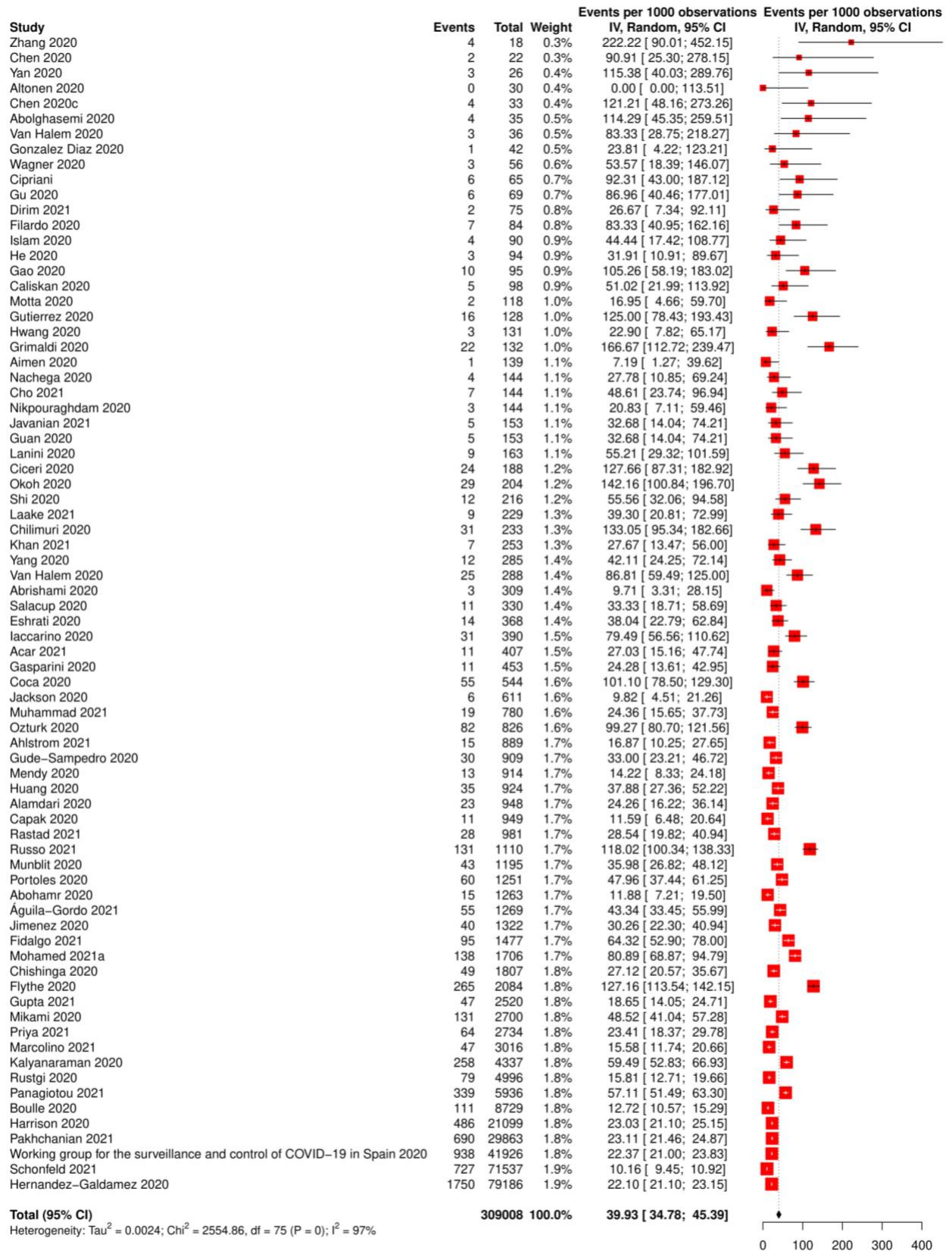
Total and observations: person-weeks; CI: confidence interval

**Figure S2.** Forest plot of the incidence rate ratio of death in people with CKD and COVID-19 compared to people with CKD without COVID-19.



Experimental: people with CKD and COVID-19; Control: people with CKD without COVID-19

**Figure S3.** Forest plot of the incidence of death in people with CKD without kidney replacement therapy and COVID-19.



Total and observations: person-weeks; CI: confidence interval

**Item S1.** Electronic database search strategies

**MEDLINE strategy**

1. **COVID-19/**
2. Coronavirus Infections/
3. covid-19.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
4. (sars-cov-2 or sars-cov2).tw.
5. "severe acute respiratory syndrome coronavirus 2".tw.
6. 2019-ncov.tw.
7. "2019 novel coronavirus".tw.
8. coronavirus.tw.
9. **or/1-8**
10. Kidney Diseases/
11. exp Renal Replacement Therapy/
12. Renal Insufficiency/
13. exp Renal Insufficiency, Chronic/
14. Diabetic Nephropathies/
15. diabetic kidney disease\$.tw.
16. diabetic nephropath\$.tw.
17. exp Hypertension, Renal/
18. dialysis.tw.
19. (hemodialysis or haemodialysis).tw.
20. (hemofiltration or haemofiltration).tw.
21. (hemodiafiltration or haemodiafiltration).tw.
22. (kidney disease\* or renal disease\* or kidney failure or renal failure).tw.
23. (ESRF or ESKF or ESRD or ESKD).tw.
24. (CKF or CKD or CRF or CRD).tw.
25. (CAPD or CCPD or APD).tw.
26. (predialysis or pre-dialysis).tw.
27. (kidney transplant\$ or renal transplant\$).tw.
28. Uremia/
29. (uremic or ur?emia).tw.
30. **or/10-29**
31. **and/9,30**

**EMBASE strategy**

1. coronavirinae/
2. Coronavirus infection/
3. covid-19.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]
4. **coronavirus disease 2019.mp.**
5. (sars-cov-2 or sars-cov2).tw.
6. "acute respiratory syndrome coronavirus 2".tw.
7. 2019 novel coronavirus.tw.
8. 2019-ncov.tw.
9. coronavirus.tw.
10. **or/1-9**
11. exp renal replacement therapy/
12. kidney disease/
13. chronic kidney disease/
14. kidney failure/
15. chronic kidney failure/
16. mild renal impairment/
17. stage 1 kidney disease/
18. moderate renal impairment/
19. severe renal impairment/
20. end stage renal disease/
21. renal replacement therapy-dependent renal disease/

22. diabetic nephropathy/
23. kidney transplantation/
24. renovascular hypertension/
25. (hemodialysis or haemodialysis).tw.
26. (hemofiltration or haemofiltration).tw.
27. (hemodiafiltration or haemodiafiltration).tw.
28. dialysis.tw.
29. (CAPD or CCPD or APD).tw.
30. (kidney disease\* or renal disease\* or kidney failure or renal failure).tw.
31. (CKF or CKD or CRF or CRD).tw.
32. (ESRF or ESKF or ESRD or ESKD).tw.
33. (predialysis or pre-dialysis).tw.
34. ((kidney or renal) adj (transplant\* or graft\* or allograft\*)).tw.
- 35. or/11-34**
- 36. and/10,35**

**PubMed LitCovid strategy (<https://www.ncbi.nlm.nih.gov/research/coronavirus/>)**

1. "Chronic kidney disease"
2. Hemodialysis or haemodialysis
3. "Peritoneal dialysis"
4. "Kidney transplantation"
- 5. or/1-4**

**Item S2.** Quality In Prognosis Studies (QUIPS) tool for assessing the risk of bias in studies of the prognostic factor

<b>Signalling Question</b>	<b>Author's judgement for 'yes'</b>
<b>Study participants: yes/no/unclear/NA</b>	
a. Adequate participation in the study by eligible people	
b. Description of the source population or population of interest	Source population for cohort with Covid-19 disease is clearly described
c. Description of the baseline study sample	Number of people with Covid-19 (probable, suspected, confirmed) is clearly described
d. Adequate description of the sampling frame and recruitment	Method of establishing the source population, selection criteria and key characteristics of the source population clearly described
e. Adequate description of the period and place of recruitment	Time period and place of recruitment for both baseline and follow-up clearly described
f. Adequate description of inclusion and exclusion criteria	Definition of people with Covid-19 disease (probable, suspected, confirmed) and description of other inclusion and exclusion criteria
<b>Study participation: risk of bias rating (high/low/unclear)</b>	<b>High:</b> most items are answered with 'no'; <b>Low:</b> all items answered with 'yes'; <b>Unclear:</b> most items are answered with 'unclear' Note: potentially a single item may introduce a high risk of bias, depending on study specifics
<b>Study attrition: yes/no/unclear/NA</b>	
a. Adequate response rate for study participants	
b. Attempts to collect information on participants who dropped out described	Attempts to collect information on participants who dropped out are described (e.g. telephone contact, mail, registers)
c. Reasons for loss to follow-up provided	Reasons on participants who dropped out are available (e.g. deceased participants between baseline and follow-up, participants moving to another location)
d. Adequate description of participants lost to follow-up	Key characteristics of participants lost to follow-up are described
e. No important differences between participants who completed the study and those who did not	Study authors described differences between participants completing the study and those who did not as not important or information provided to judge the differences
<b>Study attrition: risk of bias rating (high/low/unclear)</b>	<b>High:</b> most items are answered with 'no'; <b>Low:</b> all items answered with 'yes'; <b>Unclear:</b> most items are answered with 'unclear' Note: potentially a single item may introduce a high risk of bias, depending on study specifics
<b>Covid-19 disease status measurement: yes/no/unclear/NA</b>	
a. Clear definition or description provided	Measurements for Covid-19 disease (probable, suspected, confirmed) are provided
b. Adequately valid and reliable method of measurement	Ideally measurement for Covid-19 include a laboratory-based or point of care RT-PCR assay and meet World Health Organisation case definition
c. Continuous variables reported or appropriate cut points used	Not applicable
d. Same method and setting of measurement used in all study participants	Measurements of Covid-19 status are the same for all study participants
e. Adequate proportion of the study sample had complete data	

f. Appropriate methods of imputation were used for missing data	NA: missing measurements for Covid-19 cannot be reliably imputed
<b>Covid-19 disease status measurement: risk of bias rating (high/low/unclear)</b>	<b>High:</b> most items are answered with 'no'; <b>Low:</b> all items answered with 'yes'; <b>Unclear:</b> most items are answered with 'unclear' Note: potentially a single item may introduce a high risk of bias, depending on study specifics
<b>Outcome measurement: yes/no/unclear</b>	
a. Clear definition of the outcome provided	Measurement of the outcome of interest has to be defined and described
b. Use of adequately valid and reliable method of outcome measurement	The source of information about the outcome is provided
c. Use of same method and setting of outcome measurement in all study participants	Measurements of outcome is the same for all study participants
<b>Outcome measurement: risk of bias rating (high/low/unclear)</b>	<b>High:</b> most items are answered with 'no'; <b>Low:</b> all items answered with 'yes'; <b>Unclear:</b> most items are answered with 'unclear' Note: potentially a single item may introduce a high risk of bias, depending on study specifics
<b>Study confounding: yes/no/unclear</b>	
a. Measurement of all important confounders	Important confounders are: age, sex, co-existing illness, stage of chronic kidney disease, geographical location, immunosuppression therapy
b. Provision of clear definitions of the important confounders measured	Measurement of confounders has to be clearly described
c. Adequately valid and reliable measurement of all important confounders	Measurement of confounders is valid and reliable
d. Use of same method and setting of confounding measurement in all study participants	Measurements of confounders are the same for all study participants
e. Appropriate imputation methods used for missing confounders (if applicable)	Strategy to impute missing confounder data is described
f. Important potential confounders were accounted for in the study design	Methods section of the publication describes strategy to account for confounders
g. Important potential confounders were accounted for in the analysis	Important confounders are accounted for in multivariable logistic regression and Cox proportional hazards models
<b>Study confounding measurement: risk of bias rating (high/low/unclear)</b>	<b>High:</b> most items are answered with 'no'; <b>Low:</b> all items answered with 'yes'; <b>Unclear:</b> most items are answered with 'unclear' Note: potentially a single item may introduce a high risk of bias, depending on study specifics
<b>Statistical analysis and reporting: yes/no/unclear/NA</b>	
a. Sufficient presentation of data to assess the adequacy of the analytic strategy	Mean or median values, including confidence intervals or standard errors or standard deviations
b. Strategy for model building is appropriate and based on a conceptual framework or model	NA: we do not anticipate conceptual frameworks or explicit model building strategies for this type of research question (focusing on one prognostic factor only)
c. Statistical model is adequate for the study design	Mainly incidence rates, uni- and multivariate logistic regression, Cox proportional hazard model
d. No selective reporting of results	Critical outcomes are death, kidney replacement therapy, life participation, kidney transplant loss

<b>Statistical analysis and reporting: risk of bias rating (high/low/unclear)</b>	<b>High:</b> most items are answered with 'no'; <b>Low:</b> all items answered with 'yes'; <b>Unclear:</b> most items are answered with 'unclear' Note: potentially a single item may introduce a high risk of bias, depending on study specifics
<sup>a</sup> <b>No:</b> no or no relevant information to answer the signalling question <sup>b</sup> <b>Unclear:</b> not enough information to answer signalling question with yes or no <sup>c</sup> <b>NA (not applicable):</b> signalling question not appropriate for this type of prognostic review	



**Item S3.** References for the included studies

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**Item S4.** Studies classified by World Health Organization (WHO) regions and World Bank Income Group

The 348 included studies were performed in the following WHO regions.

- Americas: 115 studies, 341,889 participants (USA, 99 studies; Brazil, 5 studies; Mexico, 4 studies; Canada, 3 studies; Argentina, 1 study; Colombia, 1 study; Dominican Republic, 1 study; Guatemala, 1 study)
- Europe: 139 studies, 31,384 participants (Spain, 31 studies; Italy, 30 studies; UK, 24 studies; France, 15 studies; Turkey, 14 studies; Belgium, 5 studies; Germany, 4 studies; Portugal, 2 studies; Romania, 2 studies; Sweden, 2 studies; Croatia, 1 study; Denmark, 1 study; Netherlands, 1 study; Norway, 1 study; Poland, 1 study; Russia, 1 study; Slovenia, 1 study; and two or more countries in Europe, 3 studies)
- Western Pacific: 54 studies, 2018 participants (China, 44 studies; Korea, 8 studies; Japan, 1 study; Philippines, 1 study)
- South East Asia: 8 studies, 576 participants (India, 7 studies; Bangladesh, 1 study)
- Eastern Mediterranean: 22 studies, 896 participants (Iran, 13 studies; Qatar, 3 studies; Pakistan, 2 studies; Oman, 1 study; Kuwait, 1 study; Saudi Arabia, 1 study; United Arab Emirates, 1 study)
- Africa: 4 studies, 699 participants (South Africa, 2 studies; Democratic Republic of Congo, 1 study; Mauritania, 1 study)
- Two or more regions: 6 studies, 4945 participants (USA, Denmark, Greece, Germany in 1 study; USA, Spain, Italy in 1 study; UK, Ireland, Greece, Spain, Italy, Egypt, Iraq, Libya, Saudi Arabia, Sudan, Turkey, USA in 1 study; USA, UK, Germany, Italy, Spain, Russia, France, Macedonia, India, Iran, Pakistan, Peru in 1 study; UK, Sweden, Portugal, Poland, Brazil, Colombia, Saudi Arabia, Malaysia in 1 study; Spain, Italy, Germany, Ecuador in 1 study)

These studies classified by World Bank Income Groups (low, low middle, upper middle and high) are as follows:

- High income: 244 studies, 359,663 participants (USA, 99 studies; Canada, 3 studies; Spain, 31 studies; Italy, 30 studies; UK, 24 studies; France, 15 studies; Belgium, 5 studies; Germany, 4 studies; Portugal, 2 studies; Romania, 2 studies; Sweden, 2 studies; Croatia, 1 study; Denmark, 1 study; Netherlands, 1 study; Norway, 1 study; Poland, 1 study; Russia, 1 study; Slovenia, 1 study; Korea, 8 studies; Japan, 1 study; Qatar, 3 studies; Oman, 1 study; Kuwait, 1 study; Saudi Arabia, 1 study; United Arab Emirates, 1 study; and multinational, 5 studies)
- High and upper middle income: 4 studies, 1360 participants (Italy, Spain, Canada, Cuba, Germany, China, Ecuador USA, Denmark, Greece, Germany in 1 study; USA, UK, Germany, Italy, Spain, Russia, France, Macedonia, India, Iran, Pakistan, Peru in 1 study; UK, Sweden, Portugal, Poland, Brazil, Colombia, Saudi Arabia, Malaysia in 1 study; Spain, Italy, Germany, Ecuador in 1 study)
- High, upper middle and low income: 1 study, 4424 participants (Ireland, Greece, Spain, Italy, Egypt, Iraq, Libya, Saudi Arabia, Sudan, Turkey, USA in 1 study)
- Upper middle income: 86 studies, 15,957 participants (China, 44 studies; Turkey, 14 studies; Iran, 13 studies; Brazil, 5 studies; Mexico, 4 studies; South Africa, 2 studies; Argentina, 1 study; Colombia, 1 study; Dominican Republic, 1 study; Mauritania, 1 study)
- Lower middle income: 12 studies, 996 participants (India, 7 studies; Pakistan, 2 studies; Bangladesh, 1 study; Guatemala, 1 study; Philippines, 1 study)
- Low income: 1 study, 7 participants (Democratic Republic of Congo, 1 study)

**Item S5.** Other COVID-19-attributable outcomes in people with COVID-19 and CKD

<b>Dyspnea in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% confidence interval (CI)) [95% prediction interval [PrI]]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	80 (66-95) [2-234]	75	5767	Low
<b>CKD without kidney replacement therapy</b>	116 (78-161) [12-296]*	5	904	Low
<b>CKD treated by dialysis</b>	62 (48-79) [3-180]*	36	2585	Low
<b>KTR</b>	94 (71-119) [3-273]*	37	2278	Low

\*There was evidence of statistical heterogeneity between CKD subgroups (p=0.006)

Recovery from COVID-19 was defined as significant clinical improvement with or without two consecutive negative RT-PCRs on throat swab in 3 studies and was unclear in the remaining studies.

<b>COVID-19 recovery in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	83 (52-120) [0-304]	21	3463	Very low
<b>CKD without kidney replacement therapy</b>	24 (2-68)*	5	904	Very low
<b>CKD treated by dialysis</b>	71 (46-101) [7-188]*	9	363	Very low
<b>KTR</b>	107 (72-148) [15-256]*	11	656	Very low

\*There was evidence of statistical heterogeneity between CKD subgroups (p=0.007)

<b>ICU admission in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	27 (24-30) [4-63]	109	76,532	Low
<b>CKD without kidney replacement therapy</b>	19 (15-23) [4-41]*	29	64,839	Low
<b>CKD treated by dialysis</b>	25 (18-33) [0-90]*	41	8431	Low

<b>KTR</b>	38 (28-49) [0-127]*	46	2843	Low
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\*There was evidence of statistical heterogeneity between CKD subgroups (p=0.001)

<b>Hospital admission in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	93 (82-104) [15-223]	92	286,176	Low
<b>CKD without kidney replacement therapy</b>	78 (53-106) [1-245]*	20	266,313	Low
<b>CKD treated by dialysis</b>	87 (69-108) [4-255]*	44	17,613	Low
<b>KTR</b>	116 (89-145) [5-329]*	36	2250	Low

\*There was no evidence of statistical heterogeneity between CKD subgroups (p=0.11)

<b>Need for supplemental oxygen in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	96 (78-116) [4-272]	52	8996	Low
<b>CKD without kidney replacement therapy</b>	116 (45-213) [0-670]*	4	778	Low
<b>CKD treated by dialysis</b>	73 (55-93) [6-197]*	26	6714	Low
<b>KTR</b>	133 (92-180) [0-411]*	25	1391	Low

\*There was evidence of statistical heterogeneity between CKD subgroups (p=0.01)

<b>Hospital discharge in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	106 (90-123) [13-262]	63	5929	Low
<b>CKD without kidney replacement therapy</b>	99 (69-132) [15-237]*	11	2021	Low
<b>CKD treated by dialysis</b>	93 (69-121) [4-263]*	27	2336	Low
<b>KTR</b>	127 (92-166) [1-377]*	30	1268	Low

\*There was no evidence of statistical heterogeneity between CKD subgroups (p=0.24)

<b>Sepsis in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	3 (0-8) [0-22]	10	1165	Low
<b>CKD without kidney replacement therapy</b>	11 (0-91)*	2	525	Low
<b>CKD treated by dialysis</b>	13 (0-39) [0-197]*	4	318	Low
<b>KTR</b>	1 (0-3) [0-7]*	5	322	Low

\*There was no evidence of statistical heterogeneity between CKD subgroups (p=0.16)

**Item S6.** Other kidney disease-specific outcomes in people with COVID-19 and CKD

AKI was defined using the KDIGO classification<sup>1</sup> in 30 studies, the Acute Kidney Injury Network definition<sup>2</sup> in three studies, rise in serum creatinine by 0.3 mg/dl or >50% increase from baseline in one study, rise in serum creatinine by 0.5 mg/dl or >30% increase from baseline in one study, >30% reduction in estimated glomerular filtration rate (eGFR) in one study, acute kidney allograft rejection in one study, and no definition in 31 studies.

<b>Acute kidney injury in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	73 (60-87) [5-199]	59	6900	Low
<b>CKD without kidney replacement therapy</b>	80 (62-101) [18-179]*	16	4401	Low
<b>KTR</b>	69 (54-86) [4-193]*	43	2195	Low

There was no evidence of statistical heterogeneity between CKD subgroups (p=0.57)

<b>Death-censored kidney allograft loss in COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>KTR</b>	3 (1-6) [0-18]	13	1101	Low

<b>Myocardial infarction in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	9 (0-31) [0-101]	4	108	Very low
<b>CKD without kidney replacement therapy</b>	15 (0-53)*	2	243	Very low
<b>CKD treated by dialysis</b>	9 (0-53) [0-983]*	3	65	Very low
<b>KTR</b>	Not applicable	0	0	Very low

There was no evidence of statistical heterogeneity between CKD subgroups (p=0.71)

<b>Stroke in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	4 (0-9) [0-28]	5	430	Low
<b>CKD without kidney replacement therapy</b>	Not applicable	0	0	Very low

<b>CKD treated by dialysis</b>	5 (2-10) [0-53]*	3	199	Low
<b>KTR</b>	9 (0-69)*	2	231	Low

\*There was no evidence of statistical heterogeneity between CKD subgroups (p=0.70)

<b>Fatigue in people with CKD and COVID-19</b>	<b>Incidence per 1000 person weeks (95% CI) [95% PrI]</b>	<b>Number of studies</b>	<b>Number of participants</b>	<b>Evidence certainty</b>
<b>Overall CKD</b>	57 (41-75) [0-180]	33	2017	Low
<b>CKD without kidney replacement therapy</b>	62 (0-275)*	2	25	Very low
<b>CKD treated by dialysis</b>	57 (44-71) [15-121]*	19	1326	Low
<b>KTR</b>	58 (28-96) [0-236]*	12	666	Low

\*There was no evidence of statistical heterogeneity between CKD subgroups (p=0.95)

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**Item S7.** Sensitivity analysis by study sample size, risk of bias, and studies reporting both the incidence of COVID-19 and death

a) Studies with large sample size

All studies reporting on dyspnea, need for supplemental oxygen, hospital discharge, sepsis, acute dialysis, kidney allograft loss, myocardial infarction, stroke and fatigue included less than 1000 participants, preventing sensitivity analysis of the effect of sample size on these outcomes of interest in people with CKD and COVID-19. There was no evidence of statistical heterogeneity between studies based on study sample size for the incidence of acute dialysis.

There was evidence of statistical heterogeneity between studies based on study sample size for the incidence of COVID-19 in people with CKD ( $p < 0.0001$ ).

- Large sample size (1000 or more participants): incidence 38 per 10,000 person-weeks (95% CI 30 to 47; 95% PrI 2 to 120); 41 studies; 9040 participants with COVID-19 and 432,238 participants with CKD.
- Small sample size (less than 1000 participants): incidence 127 per 10,000 person-weeks (95% CI 100 to 156; 95% PrI 6 to 382); 48 studies; 5877 participants with COVID-19 and 308,214 participants with CKD.

There was evidence of statistical heterogeneity between studies based on study sample size for the incidence of death in people with CKD ( $p = 0.0003$ ).

- Large sample size (1000 or more participants): incidence 25 per 1000 person-weeks (95% CI 19 to 31; 95% PrI 6 to 56); 13 studies; 42,231 participants.
- Small sample size (less than 1000 participants): incidence 35 per 1000 person-weeks (95% CI 31 to 39; 95% PrI 0 to 109); 218 studies; 28,691 participants.

There was evidence of statistical heterogeneity between studies based on study sample size for the incidence of respiratory failure in people with CKD ( $p < 0.0001$ ).

- Large sample size (1000 or more participants): incidence 11 per 1000 person-weeks (95% CI 7 to 17; 95% PrI 0 to 50); 3 studies; 56,142 participants.
- Small sample size (less than 1000 participants): incidence 36 per 1000 person-weeks (95% CI 29 to 44; 95% PrI 0 to 134); 98 studies; 12,698 participants.

There was evidence of statistical heterogeneity between studies based on study sample size for the incidence of ICU admission in people with CKD ( $p < 0.0001$ ).

- Large sample size (1000 or more participants): incidence 6 per 1000 person-weeks (95% CI 3 to 9; 95% PrI 0 to 23); 5 studies; 62,290 participants.
- Small sample size (less than 1000 participants): incidence 32 per 1000 person-weeks (95% CI 26 to 37; 95% PrI 0 to 102); 104 studies; 14,242 participants.

There was evidence of statistical heterogeneity between studies based on study sample size for the incidence of hospital admission in people with CKD ( $p = 0.0002$ ).

- Large sample size (1000 or more participants): incidence 47 per 1000 person-weeks (95% CI 28 to 72; 95% PrI 0 to 164); 8 studies; 275,291 participants.
- Small sample size (less than 1000 participants): incidence 99 per 1000 person-weeks (95% CI 87 to 112; 95% PrI 16 to 236); 84 studies; 10,885 participants.

There was evidence of statistical heterogeneity between studies based on study sample size for the incidence of AKI in people with CKD ( $p < 0.0001$ ).

- Large sample size (1000 or more participants): incidence 127 per 1000 person-weeks (95% CI 120 to 134); 1 study; 2119 participants.
- Small sample size (less than 1000 participants): incidence 71 per 1000 person-weeks (95% CI 59 to 84; 95% PrI 7 to 185); 58 studies; 4781 participants.



There was evidence of statistical heterogeneity between studies based on study sample size for the incidence of recovery from COVID-19 in people with CKD ( $p < 0.0001$ ).

- Large sample size (1000 or more participants): incidence 10 per 1000 person-weeks (95% CI 10 to 11); 1 study; 2340 participants.
- Small sample size (less than 1000 participants): incidence 84 per 1000 person-weeks (95% CI 63 to 108; 95% PrI 13 to 203); 20 studies; 1123 participants.

b) Studies with high risk of bias

There was no evidence of statistical heterogeneity between studies based on risk of bias for the need for supplemental oxygen, hospital admission, ICU admission, hospital discharge, recovery, sepsis, acute dialysis, AKI, or fatigue. All studies reporting on myocardial infarction were deemed at high risk of bias. There was evidence of statistical heterogeneity between studies based on risk of bias for the incidence of COVID-19 in people with CKD ( $p = 0.006$ ).

- High risk of bias: incidence 61 per 10,000 person-weeks (95% CI 52 to 71; 95% PrI 5 to 170); 71 studies; 7856 participants with COVID-19, 343,714 participants with CKD.
- Low or unclear risk of bias: incidence 96 per 10,000 person-weeks (95% CI 74 to 122; 95% PrI 18 to 232); 17 studies; 7061 participants with COVID-19, 396,738 participants with CKD.

There was evidence of statistical heterogeneity between studies based on risk of bias for the incidence of death ( $p = 0.04$ ).

- High risk of bias: incidence 30 per 1000 person-weeks (95% CI 26 to 34; 95% PrI 0 to 93); 153 studies; 23,145 participants.
- Low or unclear risk of bias: incidence 38 per 1000 person-weeks (95% CI 34 to 43; 95% PrI 9 to 86); 76 studies; 47,777 participants.

There was evidence of statistical heterogeneity between studies based on risk of bias for the incidence of respiratory failure ( $p < 0.0001$ ).

- High risk of bias: incidence 23 per 1000 person-weeks (95% CI 19 to 28; 95% PrI 1 to 66); 74 studies; 48,721 participants.
- Low or unclear risk of bias: incidence 53 per 1000 person-weeks (95% CI 40 to 67; 95% PrI 2 to 159); 27 studies; 20,119 participants.

There was evidence of statistical heterogeneity between studies based on risk of bias for the incidence of dyspnea ( $p = 0.004$ ).

- High risk of bias: incidence 66 per 1000 person-weeks (95% CI 53 to 81; 95% PrI 2 to 194); 57 studies; 3475 participants.
- Low or unclear risk of bias: incidence 111 per 1000 person-weeks (95% CI 86 to 138; 95% PrI 19 to 260); 18 studies; 2292 participants.

There was evidence of statistical heterogeneity between studies based on risk of bias for the incidence of kidney allograft loss ( $p = 0.04$ ).

- High risk of bias: incidence 1 per 1000 person-weeks (95% CI 0 to 4; 95% PrI 0 to 11); 10 studies; 571 participants.
- Low or unclear risk of bias: incidence 9 per 1000 person-weeks (95% CI 5 to 14; 95% PrI 0 to 108); 3 studies; 530 participants.

There was evidence of statistical heterogeneity between studies based on risk of bias for the incidence of stroke ( $p = 0.04$ ).

- High risk of bias: incidence 5 per 1000 person-weeks (95% CI 1 to 12; 95% PrI 0 to 36); 4 studies; 229 participants.
- Low or unclear risk of bias: incidence 2 per 1000 person-weeks (95% CI 0 to 5); 1 study; 201 participants.

c) Studies reporting both the incidence of COVID-19 and death

In studies reporting both the incidence of COVID-19 and death, there was a higher incidence of death in people with CKD treated by dialysis [CKD G5D] (28 per 1000 person-weeks (95% CI 21 to 35; 95% PrI 0 to 93); 50 studies; 10,572 participants) and KTR (21 per 1000 person-weeks (95% CI 13 to 30; 95% PrI 0 to 72); 22 studies; 2734 participants), compared to people with CKD without kidney replacement therapy (KRT) (8 per 1000 person-weeks (95% CI 6 to 10); 2 studies; 121 participants) ( $p < 0.0001$  between subgroups).

**Item S8.** Subgroup analysis by WHO region, World Bank Income Group and age

a) By WHO region

There was no evidence of statistical heterogeneity between studies based on WHO region for sepsis, kidney allograft loss, myocardial infarction or stroke. The incidence of COVID-19 according to WHO region are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- Americas: incidence 68 per 10,000 person-weeks (95% CI 51 to 88; 95% PrI 9 to 178); 20 studies; 8461 participants with COVID-19 and 454,840 participants with CKD.
- European: incidence 86 per 10,000 person-weeks (95% CI 69 to 105; 95% PrI 5 to 255); 45 studies; 4820 participants with COVID-19 and 169,968 participants with CKD.
- Western Pacific: incidence 58 per 10,000 person-weeks (95% CI 39 to 81; 95% PrI 4 to 168); 13 studies; 519 participants with COVID-19 and 18,466 participants with CKD.
- Eastern Mediterranean: incidence 26 per 10,000 person-weeks (95% CI 7 to 56; 95% PrI 0 to 1142); 3 studies; 54 participants with COVID-19 and 3321 participants with CKD.
- South East Asia: incidence 18 per 10,000 person-weeks (95% CI 2 to 46; 95% PrI 0 to 281); 3 studies; 154 participants with COVID-19 and 20,461 participants with CKD.
- Africa: incidence 19 per 10,000 person-weeks (95% CI 0 to 63); 2 studies; 650 participants with COVID-19 and 62,941 participants with CKD.

The incidence of death according to WHO region are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- Americas: incidence 28 per 1000 person-weeks (95% CI 24 to 32; 95% PrI 4 to 69); 71 studies; 44,457 participants.
- European: incidence 42 per 1000 person-weeks (95% CI 36 to 48; 95% PrI 2 to 120); 101 studies; 23,185 participants.
- Western Pacific: incidence 34 per 1000 person-weeks (95% CI 26 to 43; 95% PrI 6 to 80); 28 studies; 1078 participants.
- Eastern Mediterranean: incidence 25 per 1000 person-weeks (95% CI 16 to 35; 95% PrI 0 to 69); 16 studies; 680 participants.
- South East Asia: incidence 16 per 1000 person-weeks (95% CI 7 to 28; 95% PrI 0 to 73); 7 studies; 566 participants.
- Africa: incidence 10 per 1000 person-weeks (95% CI 8 to 12; 95% PrI 7 to 14); 4 studies; 699 participants.

The incidence of respiratory failure according to WHO region are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- Americas: incidence 32 per 1000 person-weeks (95% CI 26 to 38; 95% PrI 4 to 79); 33 studies; 61,198 participants.
- European: incidence 44 per 1000 person-weeks (95% CI 34 to 56; 95% PrI 0 to 141); 35 studies; 6344 participants.
- Western Pacific: incidence 13 per 1000 person-weeks (95% CI 7 to 21; 95% PrI 0 to 38); 11 studies; 628 participants.
- Eastern Mediterranean: incidence 25 per 1000 person-weeks (95% CI 16 to 35; 95% PrI 0 to 69); 4 studies; 149 participants.
- South East Asia: incidence 5 per 1000 person-weeks (95% CI 3 to 6); 1 study; 290 participants.
- Africa: incidence 0 per 1000 person-weeks (95% CI 0 to 3); 2 studies; 87 participants.

The incidence of ICU admission according to WHO region are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- Americas: incidence 25 per 1000 person-weeks (95% CI 20 to 30; 95% PrI 5 to 58); 35 studies; 65,509 participants.
- European: incidence 34 per 1000 person-weeks (95% CI 26 to 43; 95% PrI 0 to 120); 55 studies; 9940 participants.
- Western Pacific: incidence 6 per 1000 person-weeks (95% CI 1 to 13; 95% PrI 0 to 25); 7 studies; 174 participants.
- Eastern Mediterranean: incidence 47 per 1000 person-weeks (95% CI 30 to 68; 95% PrI 6 to 117); 8 studies; 324 participants.
- South East Asia: incidence 10 per 1000 person-weeks (95% CI 5 to 15; 95% PrI 0 to 140); 3 studies; 365 participants.
- Africa: incidence 2 per 1000 person-weeks (95% CI 0 to 6); 1 study; 76 participants.

The incidence of hospital admission according to WHO region are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- Americas: incidence 81 per 1000 person-weeks (95% CI 67 to 96; 95% PrI 12 to 200); 43 studies; 277,333 participants.
- European: incidence 117 per 1000 person-weeks (95% CI 96 to 138; 95% PrI 17 to 282); 43 studies; 7783 participants.
- Western Pacific: incidence 70 per 1000 person-weeks (95% CI 53 to 89); 1 study; 66 participants.
- Eastern Mediterranean: incidence 110 per 1000 person-weeks (95% CI 56 to 179); 2 studies; 63 participants.
- South East Asia: incidence 32 per 1000 person-weeks (95% CI 28 to 36); 1 study; 250 participants.
- Africa: incidence 31 per 1000 person-weeks (95% CI 22 to 41); 2 studies; 681 participants.

The incidence of acute dialysis according to WHO region are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- Americas: incidence 22 per 1000 person-weeks (95% CI 9 to 40; 95% PrI 0 to 130); 20 studies; 13,009 participants.
- European: incidence 16 per 1000 person-weeks (95% CI 9 to 23; 95% PrI 0 to 55); 19 studies; 2251 participants.
- Western Pacific: incidence 4 per 1000 person-weeks (95% CI 0 to 9); 1 study; 253 participants.
- Eastern Mediterranean: incidence 13 per 1000 person-weeks (95% CI 2 to 31; 95% PrI 0 to 79); 5 studies; 115 participants.
- South East Asia: incidence 3 per 1000 person-weeks (95% CI 2 to 5); 2 studies; 290 participants.
- Africa: incidence 4 per 1000 person-weeks (95% CI 0 to 9); 1 study; 76 participants.

The incidence of AKI according to WHO region are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- Americas: incidence 80 per 1000 person-weeks (95% CI 62 to 101; 95% PrI 15 to 188); 19 studies; 3995 participants.
- European: incidence 72 per 1000 person-weeks (95% CI 56 to 90; 95% PrI 8 to 185); 30 studies; 2288 participants.
- Western Pacific: incidence 61 per 1000 person-weeks (95% CI 16 to 126; 95% PrI 0 to 343); 5 studies; 142 participants.
- Eastern Mediterranean: incidence 126 per 1000 person-weeks (95% CI 16 to 309); 2 studies; 41 participants.
- South East Asia: incidence 12 per 1000 person-weeks (95% CI 2 to 29); 2 studies; 290 participants.
- No studies reported the incidence of AKI in people with CKD in the African region.

#### b) By World Bank Income Group

There was no evidence of statistical heterogeneity between studies based on World Bank Income Group for AKI, sepsis, myocardial infarction or stroke.

The incidence of COVID-19 according to World Bank Income Group are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- High-income countries: incidence 76 per 10,000 person-weeks (95% CI 65 to 87; 95% PrI 12 to 189); 63 studies; 13,067 participants with COVID-19 and 631,169 participants with CKD.
- Upper middle-income countries: incidence 48 per 10,000 person-weeks (95% CI 34 to 65; 95% PrI 3 to 142); 19 studies; 1248 participants with COVID-19 and 84,844 participants with CKD.
- Lower middle-income countries: incidence 28 per 10,000 person-weeks (95% CI 5 to 67; 95% PrI 0 to 253); 5 studies; 487 participants with COVID-19 and 23,829 participants with CKD.

The incidence of death according to World Bank Income Group are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- High-income countries: incidence 36 per 1000 person-weeks (95% CI 32 to 41; 95% PrI 2 to 104); 159 studies; 48,226 participants.
- Upper middle-income countries: incidence 27 per 1000 person-weeks (95% CI 23 to 30; 95% PrI 9 to 51); 56 studies; 20,565 participants.

- Lower middle-income countries: incidence 14 per 1000 person-weeks (95% CI 7 to 23; 95% PrI 0 to 52); 11 studies; 938 participants.
- Low-income countries: incidence 28 per 1000 person-weeks (95% CI 6 to 62); 1 study; 7 participants.

The incidence of respiratory failure according to World Bank Income Group are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- High-income countries: incidence 38 per 1000 person-weeks (95% CI 32 to 44; 95% PrI 2 to 105); 73 studies; 60,202 participants.
- Upper middle-income countries: incidence 25 per 1000 person-weeks (95% CI 14 to 39; 95% PrI 0 to 120); 19 studies; 6939 participants.
- Lower middle-income countries: incidence 3 per 1000 person-weeks (95% CI 2 to 5; 95% PrI 1 to 7); 4 studies; 626 participants.
- No studies reported the incidence of respiratory failure in people with CKD in low-income countries.

The incidence of ICU admission according to World Bank Income Group are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- High-income countries: incidence 28 per 1000 person-weeks (95% CI 24 to 32; 95% PrI 4 to 68); 83 studies; 65,768 participants.
- Upper middle-income countries: incidence 28 per 1000 person-weeks (95% CI 19 to 38; 95% PrI 1 to 85); 20 studies; 8994 participants.
- Lower middle-income countries: incidence 9 per 1000 person-weeks (95% CI 6 to 13; 95% PrI 1 to 24); 5 studies; 697 participants.
- No studies reported the incidence of ICU admission in people with CKD in low-income countries.

The incidence of hospital admission according to World Bank Income Group are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- High-income countries: incidence 101 per 1000 person-weeks (95% CI 83 to 121; 95% PrI 0 to 329); 81 studies; 267,423 participants.
- Upper middle-income countries: incidence 41 per 1000 person-weeks (95% CI 32 to 50; 95% PrI 16 to 76); 8 studies; 17,105 participants.
- Lower middle-income countries: incidence 42 per 1000 person-weeks (95% CI 28 to 68); 2 studies; 575 participants.
- No studies reported the incidence of hospital admission in people with CKD in low-income countries.

The incidence of acute dialysis according to World Bank Income Group are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- High-income countries: incidence 20 per 1000 person-weeks (95% CI 12 to 30; 95% PrI 0 to 98); 39 studies; 14,424 participants.
- Upper middle-income countries: incidence 7 per 1000 person-weeks (95% CI 1 to 16; 95% PrI 0 to 42); 5 studies; 200 participants.
- Lower middle-income countries: incidence 3 per 1000 person-weeks (95% CI 1 to 4; 95% PrI 0 to 18); 3 studies; 297 participants.
- No studies reported the incidence of acute dialysis in people with CKD in low-income countries.

The incidence of AKI according to World Bank Income Group are shown below. There was evidence of statistical heterogeneity between subgroups ( $p < 0.0001$ ).

- High-income countries: incidence 77 per 1000 person-weeks (95% CI 64 to 92; 95% PrI 12 to 188); 46 studies; 6007 participants.
- Upper middle-income countries: incidence 66 per 1000 person-weeks (95% CI 38 to 102; 95% PrI 0 to 215); 11 studies; 603 participants.
- Lower middle-income countries: incidence 12 per 1000 person-weeks (95% CI 2 to 29); 2 studies; 290 participants.
- No studies reported the incidence of AKI in people with CKD in low-income countries.

The incidence of kidney allograft loss according to World Bank Income Group are shown below. There was evidence of statistical heterogeneity between subgroups ( $p = 0.03$ ).

- High-income countries: incidence 4 per 1000 person-weeks (95% CI 1 to 10; 95% PrI 0 to 26); 9 studies; 772 participants.
- Upper middle-income countries: incidence 2 per 1000 person-weeks (95% CI 0 to 11); 2 studies; 39 participants.
- Lower middle-income countries: incidence 2 per 1000 person-weeks (95% CI 1 to 28); 2 studies; 290 participants.

- No studies reported the incidence of kidney allograft loss in low-income countries.

The other clinical outcomes (dyspnea, need for supplemental oxygen, hospital discharge, recovery and fatigue) were deemed unlikely to be influenced by geographical location or country income group and were not explored in subgroup analyses.

c) By age (adult versus children with CKD)

Five studies reported on children (<18 years of age) with CKD and COVID-19, and the remaining studies reported on adults (≥18 years of age) with CKD and COVID-19. There was no evidence of statistical heterogeneity between studies based on age for ICU admission. None of the studies of children with CKD and COVID-19 reported on respiratory failure, COVID-19 recovery, sepsis, myocardial infarction, stroke or fatigue.

There was evidence of statistical heterogeneity between studies based on age for the incidence of COVID-19 in people with CKD ( $p < 0.0001$ ).

- Adult: incidence 68 per 10,000 person-weeks (95% CI 59 to 77; 95% PrI 10 to 171); 87 studies; 14,893 participants with COVID-19, 737,720 participants with CKD.
- Children: incidence 4 per 10,000 person-weeks (95% CI 3 to 6); 1 study; 24 participants with COVID-19, 2732 participants with CKD.

There was evidence of statistical heterogeneity between studies based on age for the incidence of death ( $p < 0.0001$ ).

- Adult: incidence 33 per 1000 person-weeks (95% CI 30 to 36; 95% PrI 5 to 82); 225 studies; 70,773 participants.
- Child: incidence 0 per 1000 person-weeks (95% CI 0 to 2; 95% PrI 0 to 6); 4 studies; 149 participants.

There was evidence of statistical heterogeneity between studies based on age for the incidence of dyspnea ( $p < 0.0001$ ).

- Adult: incidence 81 per 1000 person-weeks (95% CI 67 to 96; 95% PrI 3 to 236); 74 studies; 5743 participants.
- Child: incidence 4 per 1000 person-weeks (95% CI 0 to 12); 1 study; 24 participants.

There was evidence of statistical heterogeneity between studies based on age for the incidence of need for supplemental oxygen ( $p < 0.0001$ ).

- Adult: incidence 99 per 1000 person-weeks (95% CI 80 to 120; 95% PrI 4 to 279); 51 studies; 8883 participants.
- Child: incidence 14 per 1000 person-weeks (95% CI 9 to 20); 1 study; 113 participants.

There was evidence of statistical heterogeneity between studies based on age for the incidence of hospital admission ( $p < 0.0001$ ).

- Adult: incidence 94 per 1000 person-weeks (95% CI 83 to 106; 95% PrI 15 to 225); 92 studies; 286,152 participants.
- Child: incidence 15 per 1000 person-weeks (95% CI 6 to 28); 1 study; 24 participants.

There was evidence of statistical heterogeneity between studies based on age for the incidence of hospital discharge ( $p = 0.005$ ).

- Adult: incidence 107 per 1000 person-weeks (95% CI 91 to 125; 95% PrI 14 to 264); 62 studies; 5299 participants.
- Child: incidence 43 per 1000 person-weeks (95% CI 15 to 84); 1 study; 7 participants.

There was evidence of statistical heterogeneity between studies based on age for the incidence of acute dialysis ( $p = 0.02$ ).

- Adult: incidence 18 per 1000 person-weeks (95% CI 12 to 26; 95% PrI 0 to 84); 46 studies; 15963 participants.
- Child: incidence 1 per 1000 person-weeks (95% CI 0 to 15); 2 studies; 31 participants.

There was evidence of statistical heterogeneity between studies based on age for the incidence of AKI ( $p = 0.03$ ).

- Adult: incidence 76 per 1000 person-weeks (95% CI 62 to 90; 95% PrI 7 to 202); 57 studies; 6860 participants.
- Child: incidence 15 per 1000 person-weeks (95% CI 0 to 61); 2 studies; 40 participants.

There was evidence of statistical heterogeneity between studies based on age for the incidence of kidney allograft loss ( $p = 0.02$ ).

- Adult: incidence 4 per 1000 person-weeks (95% CI 1 to 8; 95% PrI 0 to 20); 12 studies; 1077 participants.
- Child: incidence 0 per 1000 person-weeks (95% CI 0 to 3); 1 study; 24 participants.

d) By study location (hospital or community)

There was evidence of statistical heterogeneity between studies based on participant location for the incidence of COVID-19 in people with CKD ( $p = 0.009$ ).

- Hospital: incidence 46 per 10,000 person-weeks (95% CI 32 to 61; 95% PrI 0 to 157); 25 studies; 6195 participants with COVID-19, 443,935 participants with CKD.
- Community: incidence 86 per 10,000 person-weeks (95% CI 61 to 115; 95% PrI 12 to 228); 10 studies; 3928 participants with COVID-19, 113,950 participants with CKD.

There was no evidence of statistical heterogeneity between studies based on participant location for the incidence of death ( $p=0.40$ ).

- Hospital: incidence 41 per 1000 person-weeks (95% CI 35 to 47; 95% PrI 1 to 121); 122 studies; 15,020 participants.
- Community: incidence 36 per 1000 person-weeks (95% CI 22 to 54; 95% PrI 0 to 120); 9 studies; 4896 participants.

e) Diabetes

Diabetes mellitus was not associated with a difference in the incidence of death in people with CKD and COVID-19, compared to those without comorbid diabetes: OR 0.98 (95% CI 0.78-1.22); 35 studies; 5387 participants.

- CKD without KRT: no study reported the incidence of death in people with CKD without KRT, COVID-19 and diabetes.
- CKD G5D: OR 0.97 (95% CI 0.75-1.27); 20 studies; 2519 participants.
- KTR: OR 0.99 (95% CI 0.66-1.48); 16 studies; 2868 participants.

f) Obesity

Obesity was not associated with a difference in the incidence of death in people with CKD and COVID-19, compared to those without comorbid obesity: OR 1.09 (95% CI 0.73-1.65); 11 studies; 1524 participants.

- CKD without KRT: no study reported the incidence of death in people with CKD without KRT, COVID-19 and obesity.
- CKD G5D: OR 1.01 (95% CI 0.64-1.59); 6 studies; 765 participants.
- KTR: OR 1.57 (95% CI 0.60-4.11); 5 studies; 759 participants.

None of the included studies reported outcomes separately for probable and definite cases of COVID-19; therefore, subgroup analysis could not be performed based on different case definitions of COVID-19. There was also insufficient reporting of COVID-19 severity or stage of CKD in studies of people with CKD and COVID-19 to perform subgroup analyses.

**Table S1.** Characteristics of each included study

Study	Study design (setting: hospitalized, community, or unclear)	Incidence ± prognosis	Outcomes	Age (variance)*	N <sup>#</sup>	Mean eGFR (ml/min per 1.73m <sup>2</sup> )	Country (WHO region)	World Bank Income Group	Follow-up (days)
<b>CKD without KRT</b>									
Abohamr 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, ICU admission	NR	104	NR	Saudi Arabia (Eastern Mediterranean)	High income	85
Acar 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	30	NR	Turkey (European)	Upper middle income	95
Aggarwal 2020	Single centre retrospective cohort study	Prognosis	Hospital admission	Median 67 (range 38-95)	6	NR	USA (Americas)	High income	NR
Águila-Gordo 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	83	NR	Spain (European)	High income	107
Ahlstrom 2021	Multicentre case-control study (hospitalized in ICU)	Prognosis	Death	NR	75	NR	Sweden (European)	High income	83
Aimen 2020	Single centre cohort study (hospitalized)	Prognosis	Acute dialysis, death, hospital discharge, ICU admission	NR	7	NR	Pakistan (Eastern Mediterranean)	Lower middle income	139
Akchurin 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	AKI, death, respiratory failure	Median 75 (IQR 65-84)	280	44	USA (Americas)	High income	NR
Alamdari 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, hospital discharge	NR	99	NR	Iran (Eastern Mediterranean)	Upper middle income	67
Alattar 2020	Multicentre retrospective cohort study	Prognosis	ICU admission	NR	4	NR	Qatar (Eastern Mediterranean)	High income	14
Arshad 2020	Multicentre retrospective cohort study	Prognosis	Death	NR	1,099	NR	USA (Americas)	High income	53
Atkins 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence	NR	NR	3,875 (23 with)	NR	UK (European)	High income	42

					COVID-19)				
Ayed 2020	Single centre retrospective cohort study (hospitalized in ICU)	Prognosis	Acute dialysis, death	NR	4	NR	Kuwait (Eastern Mediterranean)	High income	61
Azam 2020	Multicentre cohort study (hospitalized)	Prognosis	AKI	NR	90	NR	Multinational (Americas, European)	High income	NR
Bhandari 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	10	NR	India (South-East Asia)	Lower middle income	56
Bhatla 2020	Single centre cohort study (hospitalized)	Prognosis	ICU admission	NR	80	NR	USA (Americas)	High income	74
Boulle 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission	NR	62,272 (605 with COVID-19)	NR	South Africa (Africa)	Upper middle income	101
Caliskan 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, ICU admission	NR	12	NR	Turkey (European)	Upper middle income	57
Capak 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, respiratory failure	NR	54	NR	Croatia (European)	High income	123
Cecconi 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	20	NR	Italy (European)	High income	29
Chan 2020 <sup>50</sup>	Multicentre retrospective cohort study (hospitalized)	Prognosis	AKI	NR	323	NR	USA (Americas)	High income	48
Chang 2021	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Hospital admission	NR	235,813	NR	USA (Americas)	High income	274
Chen 2020 <sup>57</sup>	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	8	NR	China (Western Pacific)	Upper middle income	51
Chen 2020a <sup>58</sup>	Single centre retrospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	57	NR	China (Western Pacific)	Upper middle income	69



Chen 2020b <sup>59</sup>	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, hospital admission	NR	21	NR	China (Western Pacific)	Upper middle income	NR
Chen 2020c <sup>60</sup>	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, hospital discharge	NR	5	NR	China (Western Pacific)	Upper middle income	46
Cheng 2020 <sup>62</sup>	Single centre retrospective cohort study (hospitalized)	Prognosis	AKI	NR	21	NR	China (Western Pacific)	Upper middle income	22
Cheng 2020a <sup>63</sup>	Single centre prospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	14	NR	China (Western Pacific)	Upper middle income	30
Chilimuri 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	51	NR	USA (Americas)	High income	32
Chishin ga 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission, ICU admission	NR	157	NR	USA (Americas)	High income	91
Cho 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	36	NR	Korea (Western Pacific)	High income	28
Ciceri 2020	Single centre cohort study (hospitalized)	Prognosis	Death, hospital admission, hospital discharge	NR	47	NR	Italy (European)	High income	28
Cipriani 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	13	NR	Italy (European)	High income	35
Coca 2020	Multicentre cohort study (hospitalized)	Prognosis	AKI, death, dyspnea, ICU admission	NR	136	NR	Spain (European)	High income	28
Dai 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	AKI	NR	6	NR	China (Western Pacific)	Upper middle income	28
De Souza 2020	Multicentre retrospective cohort study (community)	Prognosis	Death	NR	111	NR	Brazil (Americas)	Upper middle income	NR
Di Fusco 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	ICU admission, respiratory failure	NR	42,178	NR	USA (Americas)	High income	214

Docherty 2020	Multicentre prospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	2,830	NR	UK (European)	High income	73
Duanmu 2020	Single centre cohort study (hospitalized)	Prognosis	Hospital admission	NR	6	NR	USA (Americas)	High income	19
Eshrati 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	78	NR	Iran (Eastern Mediterranean)	Upper middle income	33
Fidalgo 2021	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission, ICU admission	Median 78 (IQR 70-86)	383	NR	Portugal (European)	High income	27
Fisher 2020 <sup>109</sup>	Multicentre retrospective cohort study (hospitalized)	Prognosis	AKI	NR	409	NR	USA (Americas)	High income	57
Forest 2021	Single centre retrospective cohort study (hospitalized in ICU)	Prognosis	Acute dialysis	NR	81	NR	USA (Americas)	High income	30
Gao 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, hospital discharge	NR	18	NR	China (Western Pacific)	Upper middle income	37
Garces 2020	Single centre retrospective cohort study (unclear setting)	Incidence	NR	NR	44 (20 with COVID-19)	NR	Brazil (Americas)	Upper middle income	98
Giannouchos 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Hospital admission	NR	2,064	NR	Mexico (Americas)	Upper middle income	NR
Gok 2021	Single centre prospective cohort study (hospitalized)	Prognosis	AKI, death	Median 59 (range 21-99)	609	74	Turkey (European)	Upper middle income	NR
Gonzalez Diaz 2020	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	Death, hospital discharge, O2	66 (NR)	16 (6 with COVID-19)	NR	Spain (European)	High income	49
Grandonne 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	ICU admission	NR	49	NR	Italy (European)	High income	181
Grimaldi 2020	Multicentre prospective cohort study (hospitalized in ICU)	Prognosis	AKI, death	NR	33	NR	Multinational (European)	High income	28

Gu 2020	Multicentre retrospective case-control study (unclear setting)	Prognosis	Death	NR	12	NR	China (Western Pacific)	Upper middle income	40
Guan 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, fatigue, ICU admission, respiratory failure	64 ±14	21	NR	China (Western Pacific)	Upper middle income	51
Gude-Sampedro 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission, ICU admission	NR	101	NR	Spain (European)	High income	63
Gutierrez 2020	Single centre prospective cohort study (hospitalized)	Prognosis	Death	NR	29	NR	Spain (European)	High income	31
Hachim 2021	Single centre case-control study (hospitalized + community)	Prognosis	ICU admission	46 ±15	112	NR	United Arab Emirates (Eastern Mediterranean)	High income	61
Hamilton 2020	Multicentre retrospective cohort study (community)	Prognosis	AKI	NR	144	NR	UK (European)	High income	30
Hansrivijit 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	AKI	NR	66	NR	USA (Americas)	High income	92
Harrison 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death	NR	2,735	NR	USA (Americas)	High income	54
He 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	8	NR	China (Western Pacific)	Upper middle income	82
Helms 2020	Multicentre prospective cohort study (hospitalized)	Prognosis	ICU admission, respiratory failure	NR	6	NR	France (European)	High income	28
Hernandez-Galdamez 2020	Multicentre prospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission, ICU admission, respiratory failure	NR	4,581	NR	Mexico (Americas)	Upper middle income	121
Hong 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	4	NR	China (Western Pacific)	Upper middle income	57
Hua 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Respiratory failure	NR	42	NR	China (Western Pacific)	Upper middle income	60

Huang 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	77	NR	China (Western Pacific)	Upper middle income	84
Hwang 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	17	NR	Korea (Western Pacific)	High income	54
Iaccarino 2020 <sup>165</sup>	Multicentre retrospective cohort study (hospitalized)	Prognosis	ICU admission	NR	145	NR	Italy (European)	High income	52
Iaccarino 2020a <sup>166</sup>	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	88	NR	Italy (European)	High income	31
Imam 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	228	NR	USA (Americas)	High income	31
Islam 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death	NR	21	NR	Bangladesh (South-East Asia)	Lower middle income	30
Javani 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	21	NR	Iran (Eastern Mediterranean)	Upper middle income	51
Jimenez 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, ICU admission, recovery	NR	104	NR	Spain (European)	High income	89
Kalyanaraman 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, hospital admission, hospital discharge	NR	809	NR	USA (Americas)	High income	43
Khamis 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Hospital admission, hospital discharge, ICU admission, recovery	NR	4	NR	Oman (Eastern Mediterranean)	High income	60
Khan 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	29	NR	Pakistan (Eastern Mediterranean)	Lower middle income	61
Kim 2020a <sup>190</sup>	Multicentre retrospective cohort study (hospitalized)	Prognosis	ICU admission	NR	37	NR	Korea (Western Pacific)	High income	NR
Kolhe 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	AKI	NR	224	NR	UK (European)	High income	70

Laake 2021	Multicentre retrospective cohort study (hospitalized in ICU)	Prognosis	Death	NR	18	NR	Norway (European)	High income	89
Lagi 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	3	NR	Italy (European)	High income	30
Lanini 2020	Single centre cohort study (hospitalized)	Prognosis	Death	NR	19	NR	Italy (European)	High income	60
Li 2020a <sup>20</sup> <sub>3</sub>	Single centre retrospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	5	NR	China (Western Pacific)	Upper middle income	20
Ludwig 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	ICU admission, respiratory failure	NR	436	NR	Germany (European)	High income	156
Marcolino 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	104	NR	Brazil (Americas)	Upper middle income	203
Mendy 2020	Single centre retrospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission, ICU admission	NR	81	NR	USA (Americas)	High income	79
Mikami 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission	NR	525	NR	USA (Americas)	High income	36
Mohamed 2021a <sup>23</sup> <sub>1</sub>	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	597	NR	USA (Americas)	High income	20
Motta 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	11	NR	Colombia (Americas)	Upper middle income	75
Munblit 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	164	NR	Russia (European)	Upper middle income	51
Murk 2021	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Hospital admission, ICU admission	NR	9,856	NR	USA (Americas)	High income	61
Nachega 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	7	NR	Democratic Republic of Congo (Africa)	Low income	144

Ng 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	AKI	NR	492	NR	USA (Americas)	High income	58
Nikpour aghdam 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	18	NR	Iran (Eastern Mediterranean)	Upper middle income	56
Nimkar 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	AKI	NR	40	NR	USA (Americas)	High income	65
Okoh 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	46	NR	USA (Americas)	High income	31
Omrani 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Hospital admission, ICU admission	NR	44	NR	Qatar (Eastern Mediterranean)	High income	60
Palaiodimos 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	58	NR	USA (Americas)	High income	21
Palmieri 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, hospital admission	NR	618	NR	Italy (European)	High income	NR
Panagiotou 2021	Multicentre retrospective cohort study (community)	Prognosis	Death	NR	1,385	NR	USA (Americas)	High income	30
Peng 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	AKI	NR	100	NR	China (Western Pacific)	Upper middle income	83
Petrilli 2020	Single centre prospective cohort study (hospitalized + community)	Prognosis	Hospital discharge	NR	647	NR	USA (Americas)	High income	66
Portoles 2020	Single centre prospective cohort study (hospitalized)	Prognosis	Death	78 ± 11	146	NR	Spain (European)	High income	60
Priya 2021	Single centre cohort study (hospitalized)	Prognosis	Death	NR	104	NR	India (South-East Asia)	Lower middle income	184
Rastad 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	101	NR	Iran (Eastern Mediterranean)	Upper middle income	68
Russo 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, AKI, death, dyspnea, respiratory failure	80 ± 12	222	NR	Italy (European)	High income	35

Rustgi 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	289	NR	USA (Americas)	High income	121
Salacup 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	42	NR	USA (Americas)	High income	55
Schonfeld 2021	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission, ICU admission, recovery	NR	2,340	NR	Argentina (Americas)	Upper middle income	214
Shi 2020 <sup>294</sup>	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	28	NR	China (Western Pacific)	Upper middle income	54
Shi 2020a <sup>295</sup>	Single centre retrospective cohort study (hospitalized + community)	Prognosis	Hospital admission	NR	14	NR	China (Western Pacific)	Upper middle income	21
Uribarri 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Hospital admission	NR	59	NR	Multinational (European, Americas, Western Pacific)	High and upper middle income	20
Vaughan 2021	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Hospital admission	NR	11	NR	USA (Americas)	High income	28
Vigiola 2020	Single centre prospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, hospital admission, ICU admission	Median 65 (NR)	6	NR	USA (Americas)	High income	NR
Vila-Corcoles 2020	Multicentre retrospective cohort study (community)	Incidence	NR	NR	4476 (47 with COVID-19)	NR	Spain (European)	High income	61
Weiss 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission	64 ±14	2,178 (306 with COVID-19)	NR	USA (Americas)	High income	44
Working group for the surveillance and control of	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission, ICU admission	NR	3,335	NR	Spain (European)	High income	88

COVID-19 in Spain 2020									
Yamada 2020	Multicentre retrospective cohort study (community)	Prognosis	Death	NR	210	NR	USA (Americas)	High income	NR
Yan 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	4	NR	China (Western Pacific)	Upper middle income	46
Zhang 2020 <sup>344</sup>	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, fatigue, ICU admission, MI, O <sub>2</sub> , respiratory failure, sepsis	79 (NR)	4	NR	China (Western Pacific)	Upper middle income	31
<b><u>CKD G5D</u></b>									
Albalate 2020	Single centre cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission	68 ± 17	90 (36 with COVID-19)	NR	Spain (European)	High income	35
Alberici 2020 <sup>16</sup>	Multicentre cohort study (hospitalized + community)	Prognosis	Death, dyspnea, hospital admission, hospital discharge, respiratory failure, sepsis	Median 72 (IQR 62-79)	94	NR	Italy (European)	High income	8
Anisimo va 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, ICU admission, respiratory failure	NR	24	NR	USA (Americas)	High income	65
Apata 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission	Median 67 (range 43-84)	745 (18 with COVID-19)	NR	USA (Americas)	High income	44
Arslan 2020	Single centre retrospective cohort study (community)	Incidence	NR	Median 64 (range 18-83)	602 (7 with	NR	Turkey (European)	Upper middle income	NR



					COVID-19)				
Aydin Bahat 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, hospital discharge, ICU admission, O2, respiratory failure	60 ± 15	25	NR	Turkey (European)	Upper middle income	63
Bigelow 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + Prognosis	Death, hospital admission	NR	32 (15 with COVID-19)	NR	USA (Americas)	High income	30
Boushab 2020	Single centre cohort study (hospitalized)	Prognosis	Death, recovery, respiratory failure	Median 51 (range 22-70)	11	NR	Mauritania (Africa)	Lower middle income	32
Broseta 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, hospital admission, ICU admission, MI, respiratory failure	72 ± 13	429 (36 with COVID-19)	NR	Spain (European)	High income	73
Carlson 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, ICU admission	NR	17	NR	Denmark (European)	High income	60
Chan 2020a <sup>51</sup>	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, ICU admission, respiratory failure	NR	122	NR	USA (Americas)	High income	85
Chawki 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, dyspnea, hospital admission, ICU admission, O2, respiratory failure	67 ± 27	248	NR	France (European)	High income	40
Cho 2020	Multicentre cohort study (hospitalized + community)	Prognosis	Hospital admission	Median 57 (range 29-63)	11	NR	Korea (Western Pacific)	High income	28
Corbett 2020	Single centre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death	Median 67 (IQR 57-77)	1,530 (300 with COVID-19)	NR	UK (European)	High income	42
Creput 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, fatigue, hospital admission, ICU admission, vascular access thrombosis	Median 67 (range 31-89)	200 (38 with COVID-19)	NR	France (European)	High income	34

Cruzado 2020	Single centre cohort study (community)	Incidence	NR	NR	167 (8 with COVID-19)	NR	Philippines (Western Pacific)	Lower middle income	62
Daifi 2020	Single centre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, respiratory failure	NR	192 (97 with COVID-19)	NR	USA (Americas)	High income	60
De La Flor Merino 2021	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, fatigue, hospital admission	74 (NR)	76 (9 with COVID-19)	NR	Spain (European)	High income	26
Depetri 2020	Single centre cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, recovery	NR	74 (16 with COVID-19)	NR	Italy (European)	High income	61
Deshpande 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death (including IRR), ICU admission, O2, recovery	54 (NR)	1,113 (75 with COVID-19)	NR	India (South East Asia)	Lower middle income	86
Dian 2020	Single centre cohort study (hospitalized + community)	Incidence + prognosis	ICU admission	NR	181 (2 with COVID-19)	NR	Italy (European)	High income	NR
Dina-Batlle 2020	Single centre cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, ICU admission, O2, respiratory failure	NR	204 (18 with COVID-19)	NR	Dominican Republic (Americas)	Upper middle income	NR
Du 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Fatigue	Median 59 (range 36-83)	32	NR	China (Western Pacific)	Upper middle income	13
Dudreuilh 2020	Single centre cohort study (hospitalized + community)	Incidence + prognosis	Hospital admission	Median 56 (range 22-82)	664 (34 with COVID-19)	NR	UK (European)	High income	NR
Esposito 2020	Single centre cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, ICU admission, recovery	NR	260 (17 with	NR	Italy (European)	High income	NR

					COVID-19)				
Fisher 2020a <sup>110</sup>	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, hospital discharge, ICU admission, respiratory failure	63 (NR)	114	NR	USA (Americas)	High income	35
Fontana 2020	Single centre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, hospital admission, hospital discharge, MI, O <sub>2</sub> , respiratory failure, sepsis	76 ± 11	306 (15 with COVID-19)	NR	Italy (European)	High income	10
Fuentes 2020	Single centre retrospective cohort study (community)	Incidence	NR	NR	172 (16 with COVID-19)	NR	USA (Americas)	High income	54
Fuentes - Mendez 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea	45 ± 14	20	NR	Mexico (Americas)	Upper middle income	53
Galassi 2021	Multicentre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, O <sub>2</sub>	Median 67 (IQR 59-77)	307 (21 with COVID-19)	NR	Italy (European)	High income	122
Giaime 2020	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	Death, dyspnea, O <sub>2</sub> , respiratory failure	68 ± 16	270 (24 with COVID-19)	NR	France (European)	High income	21
Goicoechea 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, fatigue, hospital admission, ICU admission, O <sub>2</sub> , respiratory failure	71 ± 12	282 (36 with COVID-19)	NR	Spain (European)	High income	29
Goupil 2020	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	Death, hospital admission, ICU admission	76 (NR)	205 (34 with COVID-19)	NR	Canada (Americas)	High income	52
Gubenssek 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, hospital admission, hospital discharge	74 (range 74-75)	3	NR	Slovenia (European)	High income	NR

Hamad 2020	Single centre prospective cohort study (unclear setting)	Incidence	NR	NR	650 (8 with COVID-19)	NR	Qatar (Eastern Mediterranean)	High income	86
Harrison 2021	Multicentre case-control study (hospitalized + community)	Prognosis	Death, hospital admission	61 ± 14	865	NR	USA (Americas)	High income	30
Hendra 2021	Multicentre retrospective cohort study (community)	Incidence + prognosis	Death, hospital admission, O <sub>2</sub> , respiratory failure	64 ± 15	746 (164 with COVID-19)	NR	UK (European)	High income	45
Hsu 2021	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death (including IRR), hospital admission	65 ± 13	7,948 (438 with COVID-19)	NR	USA (Americas)	High income	90
Hu 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death	Median 65 (IQR 59-72)	129 (6 with COVID-19)	NR	China (Western Pacific)	Upper middle income	NR
Hu 2021	Multicentre retrospective cohort study (community)	Prognosis	Death	62 ± 14	88	NR	China (Western Pacific)	Upper middle income	80
Ibernon 2021	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission	NR	243 (23 with COVID-19)	NR	Spain (European)	High income	61
Islam 2021	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	Death, dyspnea, fatigue, ICU admission	62 ± 13	184 (34 with COVID-19)	NR	Turkey (European)	Upper middle income	NR
Izurieta 2021	Multicentre retrospective cohort study (hospitalized)	Incidence + prognosis	Death, ICU admission, O <sub>2</sub>	65 (NR)	292,302 (4,503 with COVID-19)	NR	USA (Americas)	High income	38
Jiang 2021	Multicentre retrospective cohort study (hospitalized)	Incidence + prognosis	Death, dyspnea, fatigue, recovery,	Median 55 (IQR 48-66)	818 (8 with	NR	China (Western Pacific)	Upper middle income	113

			respiratory failure, stroke		COVID-19)				
Jung 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, dyspnea, hospital discharge, ICU admission, O2, recovery, respiratory failure	64 ± 15	14	NR	Korea (Western Pacific)	High income	90
Keller 2020	Multicentre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, hospital discharge, O2, recovery, respiratory failure	Median 77 (IQR 68-83)	1,346 (123 with COVID-19)	NR	France (European)	High income	55
Kikuchi 2020	Multicentre retrospective cohort study (community)	Prognosis	Death, O2	NR	99	NR	Japan (Western Pacific)	High income	50
Kim 2020 <sup>189</sup>	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death	NR	62	NR	Korea (Western Pacific)	High income	NR
Kular 2020	Multicentre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, respiratory failure	66 (NR)	1737 (224 with COVID-19)	NR	UK (European)	High income	77
La Milia 2020	Single centre retrospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission, hospital discharge, O2, respiratory failure	NR	209	NR	Italy (European)	High income	17
Lacson 2020	Single centre cohort study (hospitalized + community)	Prognosis	Death, hospital admission, hospital discharge	NR	422	NR	USA (Americas)	High income	103
Lano 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, ICU admission, O2	Median 74 (IQR 64-81)	2336 (122 with COVID-19)	NR	France (European)	High income	65
Li 2020 <sup>202</sup>	Multicentre retrospective cohort study (community)	Incidence + prognosis	Death	NR	6,621 (116 with COVID-19)	NR	China (Western Pacific)	Upper middle income	61

Luo 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, hospital discharge	Median 61 (IQR 54-78)	16	NR	China (Western Pacific)	Upper middle income	61
Ma 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Fatigue, ICU admission	Median 71 (IQR 54-76)	230 (15 with COVID-19)	NR	China (Western Pacific)	Upper middle income	59
Maldonado 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, hospital admission, ICU admission, O2	62 ± 19	79 (12 with COVID-19)	NR	Spain (European)	High income	67
Manes 2020	Multicentre cohort study (hospitalized + community)	Incidence + prognosis	Hospital admission	75 (range 64-85)	83 (13 with COVID-19)	NR	Italy (European)	High income	31
Manley 2020	Multicentre retrospective cohort study (community)	Incidence	NR	NR	15,602 (351 with COVID-19)	NR	USA (Americas)	High income	75
Mazzoleni 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, ICU admission, respiratory failure	Median 75 (IQR 65-83)	62 (40 with COVID-19)	NR	Belgium (European)	High income	40
McCafferty 2020	Multicentre cohort study (community)	Incidence + prognosis	Death	NR	1253 (197 with COVID-19)	NR	UK (European)	High income	29
Medjeral - Thomas 2020	Single centre cohort study (hospitalized + community)	Prognosis	Death, dyspnea, hospital admission	Median 65 (IQR 54-74)	106	NR	UK (European)	High income	28
Michel 2020	Single centre cohort study (community)	Incidence	NR	NR	55 (2 with COVID-19)	NR	France (European)	High income	NR
Min 2021	Single centre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, fatigue	Median 63 (IQR 57-72)	627 (74 with COVID-19)	NR	China (Western Pacific)	Upper middle income	NR

Monk 2020	Single centre retrospective cohort study (hospitalized + community)	Prognosis	Death	67 (NR)	18	NR	USA (Americas)	High income	NR
Mutinelli - Szyman ski 2021	Multicentre prospective cohort study (hospitalized + community)	Prognosis	Death, dyspnea, fatigue, ICU admission, recovery	63 ± 17	62	NR	France (European)	High income	48
Navarrete 2020	Multicentre cohort study (hospitalized)	Prognosis	Death, ICU admission, respiratory failure	63 (NR)	43	NR	USA (Americas)	High income	87
Ng 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, respiratory failure	Median 66 (IQR 55-75)	419	NR	USA (Americas)	High income	88
Noce 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, ICU admission	54 (NR)	269 (42 with COVID-19)	NR	USA (Americas)	High income	90
Ossareh 2020	Single centre cohort study (hospitalized + community)	Incidence + prognosis	Death	59 ± 17	178 (27 with COVID-19)	NR	Iran (Eastern Mediterranean)	Upper middle income	182
Pena 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission	NR	9,378	NR	Mexico (Americas)	Upper middle income	260
Petrulewicz 2020	Multicentre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, fatigue, recovery, respiratory failure	66 ± 12	3,286 (23 with COVID-19)	NR	Poland (European)	High income	16
Pio-Abreu 2020	Multicentre retrospective cohort study (community)	Incidence + prognosis	Death	NR	37,852 (1,291 with COVID-19)	NR	Brazil (Americas)	Upper middle income	126
Pizarro-Sanchez 2021	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, hospital admission	73 ± 12	200 (38 with COVID-19)	NR	Spain (European)	High income	NR
Previti 2020	Multicentre cohort study (hospitalized + community)	Incidence + prognosis	Death	NR	211 (8 with	NR	Italy (European)	High income	63

					COVID-19)				
Quiroga 2021	Single centre prospective cohort study (hospitalized + community)	Prognosis	Death, fatigue, hospital admission, O2	72 ± 15	16	NR	Spain (European)	High income	45
Rastad 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, respiratory failure	63 ± 15	74	NR	Iran (Eastern Mediterranean)	Upper middle income	67
Rincon 2020	Single centre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, fatigue, hospital admission, ICU admission	74 ± 13	192 (36 with COVID-19)	NR	Spain (European)	High income	21
Rodrigo 2020	Multicentre prospective cohort study (community)	Incidence	NR	NR	226 (1 with COVID-19)	NR	Spain (European)	High income	NR
Roper 2020	Single centre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission	Median 62 (range 23-85)	670 (76 with COVID-19)	NR	UK (European)	High income	37
Ruiz 2020	Multicentre cohort study (community)	Incidence	NR	NR	610 (115 with COVID-19)	NR	Multinational (European, Americas, South-East Asia)	High and upper middle income	52
Sachdeva 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, hospital discharge, ICU admission, respiratory failure	Median 54 (NR)	11	NR	USA (Americas)	High income	107
Sankaranarayanan 2020	Multicentre cohort study (hospitalized)	Incidence + prognosis	Death, hospital discharge	55 ± 15	18,402 (39 with COVID-19)	NR	India (South-East Asia)	Lower middle income	67
Seidel 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, ICU admission	Median 76 (IQR 69-83)	755 (56 with COVID-19)	NR	Germany (European)	High income	90



Shaikh 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death	NR	85 (22 with COVID-19)	NR	USA (Americas)	High income	NR
Silberzweig 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death	NR	1,559 (241 with COVID-19)	NR	USA (Americas)	High income	74
Sim 2021	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission	Median 66 (IQR 52-74)	7,533 (133 with COVID-19)	NR	USA (Americas)	High income	122
Sipahi 2021	Single centre retrospective cohort study (hospitalized + community)	Prognosis	Death, dyspnea, hospital discharge	Median 67 (range 35-91)	23	NR	Turkey (European)	Upper middle income	40
Sosa 2021	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, hospital admission, hospital discharge, ICU admission, O <sub>2</sub> , respiratory failure	51 ± 15	3,201 (325 with COVID-19)	NR	Guatemala (Americas)	Lower middle income	120
Stefan 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, fatigue, hospital discharge, respiratory failure, stroke	Median 64 (IQR 55-71)	37	NR	Romania (European)	High income	60
Su 2020	Single centre retrospective cohort study (community)	Incidence + prognosis	Death	NR	230 (37 with COVID-19)	NR	China (Western Pacific)	Upper middle income	NR
Taji 2021	Multicentre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death, ICU admission, respiratory failure	NR	12,501 (187 with COVID-19)	NR	Canada (Americas)	High income	162
Tang 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea	NR	1,048 (52 with COVID-19)	NR	China (Western Pacific)	Upper middle income	122

Tayebi Khosroshahi 2021	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death	Median 64 (range 22-83)	670 (44 with COVID-19)	NR	Iran (Eastern Mediterranean)	Upper middle income	NR
Tian 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, fatigue, hospital discharge	Median 62 (range 23-89)	49	NR	China (Western Pacific)	Upper middle income	49
Torres Ortiz 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, ICU admission	Median 64 (range 38-90)	49	NR	USA (Americas)	High income	49
Tortone se 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, hospital discharge, ICU admission, O <sub>2</sub> , respiratory failure	Median 61 (IQR 52-73)	44	NR	France (European)	High income	32
Trivedi 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, hospital discharge	Median 48 (range 20-77)	37	NR	India (South-East Asia)	Lower middle income	29
Turgutalp 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, fatigue, ICU admission, respiratory failure	Median 63 (IQR 53-71)	567	NR	Turkey (European)	Upper middle income	46
Valeri 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, fatigue, hospital discharge, ICU admission, O <sub>2</sub> , respiratory failure	Median 63 (IQR 56-78)	59	NR	USA (Americas)	High income	52
Wang 2020 <sup>327</sup>	Single centre cohort study (hospitalized + community)	Incidence + prognosis	Death	NR	230 (37 with COVID-19)	NR	China (Western Pacific)	Upper middle income	35
Wang 2020a <sup>328</sup>	Single centre cohort study (hospitalized + community)	Incidence + prognosis	Death, fatigue, ICU admission	Median 61 (NR)	201 (5 with COVID-19)	NR	China (Western Pacific)	Upper middle income	NR
Wang 2020b <sup>329</sup>	Single centre cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, hospital discharge, O <sub>2</sub> , respiratory failure	Median 59 (IQR 47-67)	202 (7 with COVID-19)	NR	China (Western Pacific)	Upper middle income	86

Wang 2020c <sup>330</sup>	Single centre cohort study (hospitalized + community)	Incidence + prognosis	Dyspnea	NR	350 (26 with COVID-19)	NR	China (Western Pacific)	Upper middle income	37
Wu 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, fatigue, hospital discharge, ICU admission, O2, respiratory failure	Median 62 (IQR 54-71)	49	NR	China (Western Pacific)	Upper middle income	50
Xiong 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, fatigue, respiratory failure, stroke	63 ± 13	7,154 (154 with COVID-19)	NR	China (Western Pacific)	Upper middle income	70
Xu 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, dyspnea, ICU admission, respiratory failure	60 (NR)	1,542 (5 with COVID-19)	NR	China (Western Pacific)	Upper middle income	NR
Yau 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Hospital admission, ICU admission, O2	Median 66 (IQR 63-72)	237 (11 with COVID-19)	NR	Canada (Americas)	High income	30
Zapata 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, hospital discharge, respiratory failure	NR	29	NR	USA (Americas)	High income	58
Zeng 2021	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	Death (including IRR), dyspnea, fatigue	Median 63 (IQR 44-65)	695 (36 with COVID-19)	NR	China (Western Pacific)	Upper middle income	48
Ziehr 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, dyspnea, fatigue, ICU admission, respiratory failure	Median 58 (range 23-87)	66	NR	USA (Americas)	High income	34
Zou 2020	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	Death, dyspnea, fatigue, hospital admission, ICU admission, O2, respiratory failure, sepsis	Median 65 (IQR 57-72)	602 (66 with COVID-19)	NR	China (Western Pacific)	Upper middle income	85

KTR									
Abolgha semi 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, death, dyspnea, hospital discharge, ICU admission, respiratory failure	49 (range 29-64)	24	NR	Iran (Eastern Mediterranean)	Upper middle income	62
Akalin 2020	Single centre prospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, death, dyspnea, hospital admission, hospital discharge, O <sub>2</sub> , respiratory failure	Median 60 (range 32-77)	36	NR	USA (Americas)	High income	21
Akdur 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence	NR	NR	509 (1 with COVID-19)	NR	Turkey (European)	Upper middle income	61
Al Azzi 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, death, ICU admission, respiratory failure	NR	75	NR	USA (Americas)	High income	NR
Alberici 2020a <sup>17</sup>	Single centre prospective cohort study (hospitalized)	Prognosis	Acute dialysis, AKI, death, dyspnea, hospital discharge, ICU admission, O <sub>2</sub> , respiratory failure	Median 59 (IQR 51-64)	20	37	Italy (European)	High income	7
Azzi 2020	Single centre prospective cohort study (hospitalized + community)	Incidence + prognosis	Acute dialysis, death, hospital admission, respiratory failure, sepsis, stroke	NR	1,475 (201 with COVID-19)	NR	USA (Americas)	High income	140
Bannerjee 2020	Multicentre prospective cohort study (hospitalized + community)	Incidence + prognosis	Acute dialysis, AKI, death, dyspnea, graft loss, hospital admission, hospital discharge, ICU admission, O <sub>2</sub> , recovery, respiratory failure	Median 54 (range 45-69)	2,082 (7 with COVID-19)	27	UK (European)	High income	42

Benotman 2020	Single centre retrospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, AKI, dyspnea, graft loss, hospital admission, hospital discharge, ICU admission, O2, respiratory failure	Median 64 (IQR 55-68)	49	NR	France (European)	High income	58
Binda 2020	Single centre cohort study (hospitalized + community)	Incidence	NR	63 (NR)	143 (1 with COVID-19)	36	Italy (European)	High income	38
Bosch 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, death, hospital admission, hospital discharge, ICU admission, O2, respiratory failure	Median 61 (NR)	3	NR	Germany (European)	High income	NR
Bossini 2020	Multicentre cohort study (hospitalized)	Prognosis	Acute dialysis, AKI, death, fatigue, hospital admission, hospital discharge, ICU admission, respiratory failure, sepsis	Median 60 (IQR 50-67)	53	NR	Italy (European)	High income	26
Chaudhry 2020	Multicentre retrospective case-control study (hospitalized)	Prognosis	Acute dialysis, death, dyspnea, fatigue, hospital admission, hospital discharge, ICU admission, respiratory failure	Median 62 (IQR 52-70)	38	NR	USA (Americas)	High income	35
Chavart 2020	Multicentre retrospective case-control study (hospitalized)	Prognosis	AKI, death, dyspnea, hospital discharge, ICU admission, O2, respiratory failure	Median 65 (IQR 55-73)	100	43	France (European)	High income	13
Chen 2020 <sup>d61</sup>	Single centre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, AKI, death, dyspnea, hospital discharge, O2, respiratory failure, stroke	56 ± 12	30	57	USA (Americas)	High income	13

Cravedi 2020	Multicentre retrospective cohort study (hospitalized)	Incidence + prognosis	AKI, death, dyspnea, ICU admission, respiratory failure	Median 62 (IQR 52-69)	9,845 (144 with COVID-19)	NR	Multinational (Americas, European)	High income	52
Crespo 2020 <sup>77</sup>	Multicentre prospective cohort study (hospitalized + community)	Prognosis	Death, dyspnea, hospital admission, ICU admission, recovery, respiratory failure	Median 62 (IQR 52-71)	414	NR	Spain (European)	High income	44
Crespo 2020a <sup>78</sup>	Single centre prospective cohort study (hospitalized + community)	Incidence + prognosis	Acute dialysis, AKI, death, dyspnea, ICU admission, recovery, respiratory failure	74 ± 5	803 (20 with COVID-19)	NR	Spain (European)	High income	28
Cucchia ri 2020	Single centre cohort study (hospitalized + community)	Prognosis	Acute dialysis, AKI, death, dyspnea, hospital admission, hospital discharge, ICU admission	Median 53 (IQR 46-68)	45	NR	Spain (European)	High income	68
Demir 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	AKI, death, dyspnea, hospital admission, ICU admission, O <sub>2</sub> , respiratory failure	45 ± 15	40	NR	Turkey (European)	Upper middle income	32
Devresse 2020	Single centre prospective cohort study (hospitalized + community)	Prognosis	AKI, death, dyspnea, hospital admission, hospital discharge, ICU admission, O <sub>2</sub> , respiratory failure	Median 57 (IQR 41-73)	22	45	Belgium (European)	High income	18
Dhelr 2020	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	Acute dialysis, AKI, death, graft loss, hospital discharge, ICU admission, respiratory failure, sepsis	48 ± 10	380 (20 with COVID-19)	NR	Turkey (European)	Upper middle income	135
Elec 2021	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	Acute dialysis, AKI, death, hospital discharge, ICU admission, O <sub>2</sub>	Median 52 (range 20-72)	1,467 (42 with COVID-19)	50	Romania (European)	High income	193

Elias 2020	Single centre prospective cohort study (hospitalized + community)	Incidence + prognosis	Acute dialysis, AKI, death, dyspnea, hospital admission, recovery, respiratory failure	56 ± 13	1,216 (66 with COVID-19)	NR	France (European)	High income	61
Felldin 2021	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, hospital discharge, O <sub>2</sub> , respiratory failure	NR	2,563 (31 with COVID-19)	NR	Sweden (European)	High income	123
Fernandez-Ruiz 2020	Single centre cohort study (hospitalized + community)	Prognosis	Acute dialysis, AKI, death, dyspnea, hospital discharge, O <sub>2</sub> , recovery, respiratory failure, sepsis	NR	8	NR	Spain (European)	High income	18
Gandolfi ni 2020	Single centre retrospective cohort study (hospitalized + community)	Prognosis	AKI, death	50 (NR)	17	NR	Italy (European)	High income	30
Georgery 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, ICU admission	63 (range 23-88)	27	49	Belgium (European)	High income	21
Ghaffari 2020	Single centre cohort study (hospitalized)	Incidence + prognosis	Acute dialysis, AKI, death, dyspnea, graft loss, hospital admission, ICU admission, respiratory failure	48 ± 12	2,493 (19 with COVID-19)	50	Iran (Eastern Mediterranean)	Upper middle income	24
Gisondi 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence	NR	NR	247 (1 with COVID-19)	NR	Italy (European)	High income	19
Hardesty 2021	Single centre case-control study (hospitalized)	Prognosis	Acute dialysis, death, O <sub>2</sub> , respiratory failure	Median 55 (range 33-68)	11	NR	USA (Americas)	High income	79
Hartzell 2020	Single centre case-control study (hospitalized + community)	Prognosis	AKI, death, hospital discharge, ICU admission	55 ± 14	18	NR	USA (Americas)	High income	48
Husain 2020	Single centre prospective cohort study (hospitalized + community)	Prognosis	Dyspnea, fatigue, hospital admission, recovery	Median 49 (IQR 41-63)	41	NR	USA (Americas)	High income	19

Hussain 2020	Single centre retrospective cohort study (unclear setting)	Prognosis	Acute dialysis, AKI, death, ICU admission, respiratory failure	Median 61 (range 33-84)	25	NR	UK (European)	High income	52
Jarrin Tejada 2020	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	AKI, death, dyspnea, fatigue, ICU admission, O <sub>2</sub> , respiratory failure	Median 56 (IQR 47-66)	340 (25 with COVID-19)	NR	USA (Americas)	High income	62
Katz-Greenberg 2020	Single centre cohort study (hospitalized + community)	Prognosis	Acute dialysis, AKI, death, hospital admission, respiratory failure	Median 54 (IQR 47-63)	20	NR	USA (Americas)	High income	25
Khalid 2021	Single centre prospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, death, graft loss, hospital admission, ICU admission	Median 57 (range 24-69)	13	NR	UK (European)	High income	31
Kute 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, AKI, death, dyspnea, fatigue, graft loss, hospital admission, hospital discharge, ICU admission, O <sub>2</sub> , respiratory failure	Median 43 (IQR 35-51)	250	NR	India (South-East Asia)	Lower middle income	177
Lubetzky 2020	Single centre retrospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, AKI, death, dyspnea, graft loss, hospital admission, hospital discharge, O <sub>2</sub> , respiratory failure	Median 57 (range 29-83)	54	NR	USA (Americas)	High income	37
Lum 2020	Single centre retrospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, AKI, death, hospital admission, ICU admission, respiratory failure,	49 (NR)	41	NR	USA (Americas)	High income	90
Mahmoud 2020	Single centre cohort study (hospitalized)	Prognosis	Acute dialysis, AKI, death, ICU admission, respiratory failure	NR	23	NR	USA (Americas)	High income	48
Marathi 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, death, hospital discharge,	NR	6	NR	USA (Americas)	High income	9



			ICU admission, O2, respiratory failure						
Maritati 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, AKI, death, dyspnea, fatigue, hospital admission, hospital discharge, O2, recovery, respiratory failure	66 ± 10	5	NR	Italy (European)	High income	NR
Mehta 2020	Single centre retrospective cohort study (hospitalized + community)	Prognosis	Death, hospital admission, hospital discharge, recovery	Median 59 (IQR 53-64)	35	NR	USA (Americas)	High income	28
Merhi 2020	Single centre cohort study (hospitalized + community)	Prognosis	Death, hospital admission	Median 54 (NR)	16	NR	USA (Americas)	High income	79
Meziyer h 2020	Single centre cohort study (hospitalized)	Prognosis	AKI, death, dyspnea, ICU admission, respiratory failure	Median 56 (IQR 49-72)	15	42	Netherlands (European)	High income	30
Mohamed 2021 <sup>230</sup>	Single centre cohort study (hospitalized + community)	Prognosis	AKI, death, ICU admission	Median 57 (range 25-72)	28	NR	UK (European)	High income	51
Molaei 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, ICU admission, respiratory failure	60 (range 46-68)	10	NR	Iran (Eastern Mediterranean)	Upper middle income	50
Monfared 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	AKI, death, dyspnea, fatigue, hospital discharge, O2, respiratory failure	Median 52 (IQR 41-63)	22	60	Iran (Eastern Mediterranean)	Upper middle income	60
Montagud-Marrahi 2020	Single centre retrospective cohort study (hospitalized + community)	Prognosis	AKI, death, hospital admission, hospital discharge, ICU admission, respiratory failure	57 ± 17	33	NR	Spain (European)	High income	NR
Nair 2020	Multicentre prospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, AKI, death, dyspnea, fatigue, hospital admission, hospital discharge, ICU	Median 57 (IQR 47-67)	30	NR	USA (Americas)	High income	61

			admission, O2, respiratory failure						
Ortiz 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	AKI, death, hospital admission, ICU admission	NR	33	NR	USA (Americas)	High income	61
Pascual 2020	Multicentre prospective cohort study (hospitalized)	Prognosis	Death, dyspnea, hospital admission, ICU admission	NR	24	NR	Spain (European)	High income	60
Perez-Saez 2020	Multicentre prospective cohort study (hospitalized)	Prognosis	Acute dialysis, AKI, death, dyspnea, ICU admission, respiratory failure	59 ± 12	80	NR	Spain (European)	High income	25
Pierrotti 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, AKI, death, ICU admission, respiratory failure	Median 52 (range 17-78)	51	24	Brazil (Americas)	Upper middle income	NR
Santeus anio 2021	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Acute dialysis, AKI, death, graft loss, hospital admission, hospital discharge, O2, respiratory failure	54 ± 14	2,126 (95 with COVID-19)	53	USA (Americas)	High income	62
Shrivastava 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, AKI, death, ICU admission, respiratory failure	Median 62 (IQR 55-69)	39	NR	USA (Americas)	High income	41
Silva 2020	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	Death, dyspnea, fatigue, hospital admission, hospital discharge, ICU admission, recovery	Median 56 (range 35-63)	1,850 (5 with COVID-19)	48	Portugal (European)	High income	20
Thaunat 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death	57 ± 15	42,812 (606 with COVID-19)	53	France (European)	High income	93
Varnell 2021	Multicentre prospective cohort study (hospitalized + community)	Incidence + prognosis	Acute dialysis, AKI, death, dyspnea, graft loss, hospital admission, ICU admission, respiratory failure	Median 15 (IQR 8-19)	2,732 (24 with COVID-19)	NR	USA (Americas)	High income	151

Vistoli 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, hospital admission, ICU admission	NR	261 (3 with COVID-19)	NR	Italy (European)	High income	44
Yi 2020	Single centre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Hospital admission, ICU admission	NR	64 (14 with COVID-19)	NR	USA (Americas)	High income	113
Zhang 2020a <sup>34</sup> <sub>5</sub>	Single centre prospective cohort study (hospitalized + community)	Incidence + prognosis	AKI, dyspnea, fatigue, hospital discharge, recovery	45 ± 11	743 (5 with COVID-19)	NR	China (Western Pacific)	Upper middle income	32
Zhu 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	AKI, death, dyspnea, fatigue, hospital discharge, O <sub>2</sub> , recovery, respiratory failure	45 (24-65)	10	NR	China (Western Pacific)	Upper middle income	36
<b>KTR or SPK</b>									
Caillard 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, AKI, death, dyspnea, graft loss, hospital admission, ICU admission, O <sub>2</sub> , respiratory failure	NR	273	NR	France (European)	High income	58
Fava 2020	Multicentre retrospective cohort study (hospitalized)	Incidence + prognosis	AKI, death, dyspnea, hospital discharge, ICU admission, O <sub>2</sub> , respiratory failure	60 ± 12	7,092 (106 with COVID-19)	48	Spain (European)	High income	15
Mamod e 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, death, fatigue, graft loss, ICU admission, respiratory failure	56 ± 13	121	NR	UK (European)	High income	58
Pereira 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Hospital admission	NR	47	NR	USA (Americas)	High income	20

Sran 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Acute dialysis, AKI, death, dyspnea, fatigue, hospital admission, ICU admission	Median 58 (IQR 48-64)	2,848 (66 with COVID-19)	39	UK (European)	High income	55
Virmani 2020	Single centre retrospective cohort study (hospitalized + community)	Prognosis	Dyspnea, hospital admission	60 (NR)	20	NR	USA (Americas)	High income	31
<b>CKD without KRT or <u>CKD G5D</u></b>									
Abrishami 2020	Single centre cohort study (hospitalized)	Prognosis	Acute dialysis, death, hospital discharge	61 ± 14	43	NR	Iran (Eastern Mediterranean)	Upper middle income	54
Altonen 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	16	NR	USA (Americas)	High income	52
Argenzi ano 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Hospital admission, ICU admission	NR	12	NR	USA (Americas)	High income	35
Auld 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	58	NR	USA (Americas)	High income	42
Dirim 2021	Single centre case-control study (hospitalized)	Prognosis	AKI, death, ICU admission, O <sub>2</sub> , respiratory failure	Median 63 (IQR 50-74)	56	NR	Turkey (European)	Upper middle income	44
Filardo 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, hospital discharge, ICU admission	NR	32	NR	USA (Americas)	High income	31
Flythe 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, death, dyspnea, O <sub>2</sub> , respiratory failure, sepsis	CKD without KRT: median 69 (IQR 60-76) <u>CKD G5D</u> : median 65 (IQR 56-71)	664	NR	USA (Americas)	High income	28
Fried 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Respiratory failure	NR	1854	NR	USA (Americas)	High income	66
Geriatric Medicin	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	4,424	NR	Multinational (European,	High, upper	NR

e Research Collaborative 2021							Eastern Mediterranean, Americas)	middle, and low income	
Gottlieb 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	504	NR	USA (Americas)	High income	110
Gupta 2021 <sup>140</sup>	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	NR	134	NR	USA (Americas)	High income	210
Jackson 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, respiratory failure	NR	94	NR	USA (Americas)	High income	69
Ji 2020	Multicentre retrospective case-control study (hospitalized + community)	Incidence	NR	NR	9,149 (72 with COVID-19)	NR	Korea (Western Pacific)	High income	NR
Kang 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, MI, O2, respiratory failure	CKD without KRT: 63 ± 15 <u>CKD G5D:</u> 60 ± 15	253	NR	Korea (Western Pacific)	High income	24
Muhammad 2021	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	87	NR	USA (Americas)	High income	91
Oetjens 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence + prognosis	Death, ICU admission, respiratory failure	NR	81,255 (115 with COVID-19)	NR	USA (Americas)	High income	74
Orlando 2021	Multicentre case-control (hospitalized + community)	Prognosis	Death	NR	67	NR	Italy (European)	High income	NR
Pakhchanian 2021	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, death, hospital admission, respiratory failure	NR	9,383	NR	USA (Americas)	High income	30
Patel 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Respiratory failure	NR	24	NR	USA (Americas)	High income	46
Plumb 2020	Multicentre retrospective cohort study (community)	Prognosis	Death	Median 11 (IQR 8-12)	5	NR	UK (European)	High income	112
Suleyman 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Hospital admission, ICU admission	NR	208	NR	USA (Americas)	High income	30

Van Halem 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death, hospital discharge	NR	63	NR	Belgium (European)	High income	36
Vlachos 2021	Single centre prospective cohort study (hospitalized)	Prognosis	ICU admission	NR	75	NR	UK (European)	High income	36
Wagner 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Death	NR	17	NR	USA (Americas)	High income	30
Yang 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	CKD without KRT: median 74 (IQR 65-86) <u>CKD G5D</u> : median 58 (IQR 47-68)	39	NR	China (Western Pacific)	Upper middle income	83
Yu 2020	Multicentre prospective cohort study (hospitalized)	Prognosis	Hospital admission	NR	8	NR	China (Western Pacific)	Upper middle income	26
<b>CKD without KRT, <u>CKD G5D</u> or KTR</b>									
Antonius 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, death, recovery	NR	37	NR	UK (European)	High income	NR
Bhargava 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Respiratory failure	NR	34	NR	USA (Americas)	High income	31
Chang 2020	Multicentre retrospective case-control study (hospitalized + community)	Prognosis	Hospital admission	NR	141	NR	USA (Americas)	High income	97
Edler 2020	Single centre cohort study (hospitalized)	Prognosis	Death	NR	26	NR	Germany (European)	High income	29
Fominский 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	Acute dialysis, AKI, ICU admission	NR	6	NR	Italy (European)	High income	55
Gasparini 2020	Multicentre retrospective cohort study (hospitalized in ICU)	Prognosis	Acute dialysis, death	CKD without KRT: median 60 (IQR 54-66) <u>CKD</u>	48	NR	UK (European)	High income	144

				<u>G5D</u> : median 60 (IQR 57-68)					
Melgosa 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	AKI	Median 12 (range 1 month to 17 years)	16	NR	Spain (European)	High income	46
Ozturk 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death, hospital discharge, ICU admission, respiratory failure	NR	760	NR	Turkey (European)	Upper middle income	20
Ozturk 2021	Multicentre retrospective cohort study (hospitalized)	Prognosis	AKI, death, hospital discharge, ICU admission, respiratory failure	NR	304	NR	Turkey (European)	Upper middle income	40
<b>CKD without KRT or KTR</b>									
Gupta 2021a <sup>14</sup> 1	Multicentre retrospective cohort study (hospitalized in ICU)	Prognosis	Acute dialysis, AKI	NR	2,119	NR	USA (Americas)	High income	28
Marlais 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death, O2	Median 13 (NR)	113	NR	Multinational (European and Eastern Mediterranean)	High and upper middle income	113
<b><u>CKD G5D</u> or KTR</b>									
Arenas 2020	Cohort study (hospitalized + community)	Incidence	NR	NR	1,023 (34 with COVID- 19)	NR	Spain (European)	High income	NR
Bell 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence	NR	NR	5,461 (110 with COVID- 19)	NR	UK (European)	High income	92
Clarke 2021	Single centre cohort study (community)	Incidence + prognosis	Death	NR	1,433 (271 with COVID- 19)	NR	UK (European)	High income	68

Corcillo 2020	Single centre cohort study (hospitalized)	Prognosis	Death, ICU admission, respiratory failure	CKD G5D: median 66 (range 23-91) KTR: median 58 (range 35-82)	39	38 (KTR)	UK (European)	High income	61
Craig-Schapiro 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, AKI, death, dyspnea, graft loss, hospital admission, hospital discharge, O2, respiratory failure	CKD G5D: median 60 (range 38-86) KTR: median 57 (range 28-83)	136	NR	USA (Americas)	High income	77-78
De Meester 2020	Multicentre prospective cohort study (hospitalized + community)	Incidence + prognosis	Death (including IRR)	NR	7,919 (280 with COVID-19)	NR	Belgium (European)	High income	85
Hillbrands 2020	Multicentre prospective cohort study (hospitalized + community)	Prognosis	Acute dialysis, death, hospital admission, ICU admission, respiratory failure	CKD G5D: 67 ± 14 KTR: 60 ± 13	1,073	NR	Multinational (European)	High and upper middle income	28
Jager 2020	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death	CKD G5D: median 72 (IQR 61-81) KTR: median 61 (IQR 51-69)	4,298	NR	Multinational (European)	High income	28
Jones 2021	Multicentre prospective cohort study (hospitalized + community)	Incidence + prognosis	Acute dialysis, death, hospital admission, ICU admission, recovery, respiratory failure	CKD G5D: 39 ± 10 KTR: 46 ± 18	669 (76 with COVID-19)	NR	South Africa (Africa)	Upper middle income	128
Kumaresan 2020	Single centre retrospective cohort study (hospitalized)	Incidence + prognosis	Acute dialysis, AKI, death, dyspnea, graft loss, ICU admission,	Median 55 (range 38-64)	946 (40 with	NR	India (South-East Asia)	Lower middle income	245



			O <sub>2</sub> , respiratory failure, sepsis		COVID-19)				
Lapalu 2021	Multicentre retrospective cohort study (hospitalized + community)	Prognosis	Death	<u>CKD G5D:</u> median 72 (IQR 60-81) KTR: median 60 (IQR 50-69)	3,209	NR	France (European)	High income	218
Manganaro 2020	Multicentre retrospective cohort study (hospitalized + community)	Incidence	NR	NR	5,793 (128 with COVID-19)	NR	Italy (European)	High income	35
Quintalani 2020	Multicentre retrospective cohort study (community)	Incidence + prognosis	Death	NR	60,441 (1368 with COVID-19)	NR	Italy (European)	High income	39
Sanchez-Alvarez 2020	Multicentre retrospective cohort study (hospitalized)	Prognosis	Death	<u>CKD G5D:</u> 71 ± 15 KTR: 60 ± 13	868	NR	Spain (European)	High income	24
Trujillo 2020	Single centre retrospective cohort study (hospitalized)	Prognosis	AKI, death, dyspnea, hospital discharge, respiratory failure	63 ± 15	51	NR	Spain (European)	High income	13

CKD: chronic kidney disease; eGFR: estimated glomerular filtration rate; WHO: World Health Organization; NR: not reported; KTR: kidney transplant recipient; SPK: simultaneous pancreas kidney transplant recipient; USA: United States of America; UK: United Kingdom; AKI: acute kidney injury; ICU: intensive care unit; MI: myocardial infarction; O<sub>2</sub>: need for supplemental oxygen; SD: standard deviation; IQR: interquartile range; IRR: incidence rate ratio comparing death in people with CKD and COVID-19 compared to people with CKD without COVID-19.

<sup>^</sup> Age reported as mean and standard deviation, unless otherwise specified

<sup>\*</sup> Number of participants with CKD