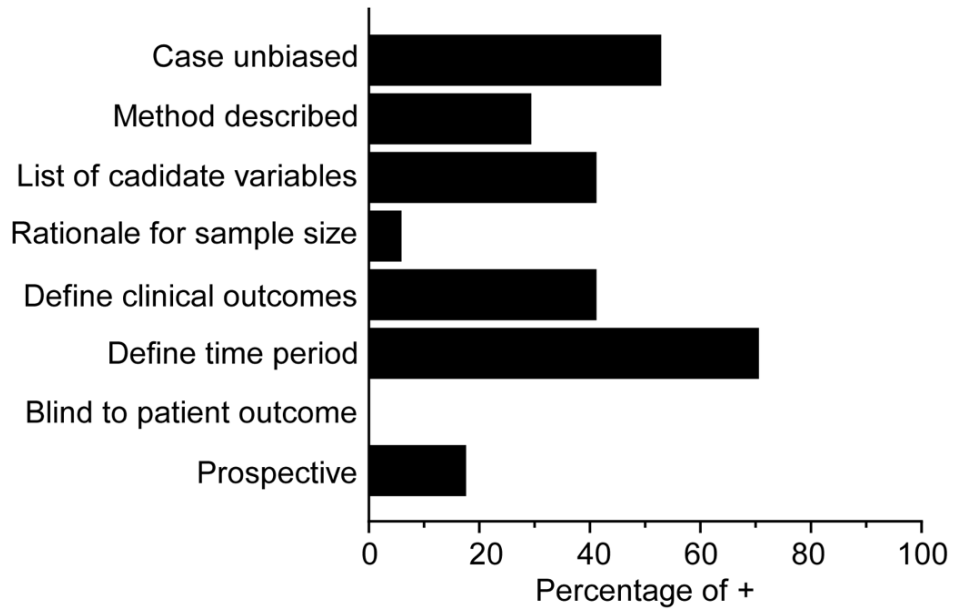


**Supplemental Files**

**Figure S1** Quality measurements of the 17 eligible studies were reviewed by the modified questionnaire (Tables S2 & 3).



**Table S1** Search strategy and search results

Database: PubMed

Search date: 06/16/2021

| <b>Group</b>   | <b>Keywords</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Results</b> |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 1. Coronavirus | "Coronavirus"[MeSH Terms] OR "Middle East Respiratory Syndrome Coronavirus"[MeSH Terms] OR "SARS Virus"[MeSH Terms] OR "SARS-CoV-2"[MeSH Terms] OR "coronavirus nl63, human"[MeSH Terms] OR "COVID-19"[MeSH Terms] OR "Coronavirus"[Text Word] OR "Coronaviruses"[Text Word] OR "Middle East Respiratory Syndrome Coronavirus"[Text Word] OR "MERS"[Text Word] OR "MERS-CoV"[Text Word] OR "Severe Acute Respiratory Syndrome Virus"[Text Word] OR "SARS"[Text Word] OR "SARS-CoV"[Text Word] OR "Severe Acute Respiratory Syndrome Coronavirus 2"[Text Word] OR "SARS-CoV-2"[Text Word] OR "SARS-CoV2"[Text Word] OR "COVID-19"[Text Word] OR "2019 novel coronavirus"[Text Word] OR "2019 Novel Coronaviruses"[Text Word] OR "2019 nCoV"[Text Word] OR "n-CoV"[Text Word] OR "Wuhan coronavirus"[Text Word] OR "Coronavirus NL63"[Text Word] OR "HCoV-NL63"[Text Word] | 167,189        |
| 2. Cancer      | "Neoplasms"[MeSH Terms] OR "Neoplasm"[Text Word] OR "Neoplasms"[Text Word] OR "cancer"[Text Word] OR "cancers"[Text Word] OR "tumor"[Text Word] OR "tumors"[Text Word] OR "malignant"[Text Word] OR "malignancy"[Text Word] OR "malignancies"[Text Word]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 4,627,605      |
| 3. Biomarkers  | "Cytokines"[MeSH Terms] OR "Chemokines"[MeSH Terms] OR "Biomarkers"[MeSH Terms] OR "cytokine"[Text Word] OR "Cytokines"[Text Word] OR "chemokine"[Text Word] OR "Chemokines"[Text Word] OR "Biomarkers"[Text Word] OR "biomarker"[Text Word] OR "Immune Markers"[Text Word] OR "Immune Marker"[Text Word] OR "immunologic Markers"[Text Word] OR "immunologic Marker"[Text Word] OR "blood biomarker"[Text Word] OR "blood biomarkers"[Text Word] OR "serum biomarker"[Text Word] OR "serum biomarkers"[Text Word] OR "plasma biomarker"[Text Word] OR "plasma biomarkers"[Text Word] OR "plasma marker"[Text Word] OR "plasma markers"[Text Word] OR "serum marker"[Text Word] OR "serum markers"[Text Word] OR "blood marker"[Text Word] OR "blood                                                                                                                     | 1,880,058      |

markers"[Text Word] OR "blood indicator"[Text Word] OR "blood indicators"[Text Word] OR "serum indicator"[Text Word] OR "serum indicators"[Text Word] OR "plasma indicator"[Text Word] OR "plasma indicators"[Text Word] OR "plasma factors"[Text Word] OR "plasma factor"[Text Word] OR "serum factors"[Text Word] OR "serum factor"[Text Word] OR "blood factors"[Text Word] OR "blood factor"[Text Word] OR "biological marker"[Text Word] OR "biological markers"[Text Word] OR "biologic marker"[Text Word] OR "biologic markers"[Text Word] OR "urine marker"[Text Word] OR "urine markers"[Text Word] OR "CSF marker"[Text Word] OR "CSF markers"[Text Word] OR "urine indicators"[Text Word] OR "CSF indicators"[Text Word] OR "urine factor"[Text Word] OR "urine factors"[Text Word] OR "CSF factor"[Text Word] OR "CSF factors"[Text Word] OR "urine biomarker"[Text Word] OR "urine biomarkers"[Text Word] OR "CSF biomarker"[Text Word] OR "CSF biomarkers"[Text Word] OR "bronchoalveolar lavage fluid"[Text Word] OR "bronchoalveolar lavage fluids"[Text Word] OR "cerebrospinal fluid"[Text Word] OR "cerebrospinal fluids"[Text Word]

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 4. Disease progression | <p>"Disease Progression"[MeSH Terms] OR "Prognosis"[MeSH Terms] OR "Recurrence"[MeSH Terms] OR "epithelial mesenchymal transition"[MeSH Terms] OR "Neoplasm Metastasis"[MeSH Terms] OR "Disease Progression"[Text Word] OR "Disease Progressions"[Text Word] OR "cancer progression"[Text Word] OR "Cancer Progressions"[Text Word] OR "Tumor Progression"[Text Word] OR "tumor Progressions"[Text Word] OR "Prognosis"[Text Word] OR "Prognoses"[Text Word] OR "Recurrence"[Text Word] OR "Recurrent"[Text Word] OR "relapse"[Text Word] OR "relapses"[Text Word] OR "transform"[Text Word] OR "transformation"[Text Word] OR "transformations"[Text Word] OR "EMT"[Text Word] OR "epithelial mesenchymal transition"[Text Word] OR "stage"[Text Word] OR "stages"[Text Word] OR "metastasis"[Text Word] OR "metastases"[Text Word] OR "metastatic"[Text Word] OR "tumorigenesis"[Text Word] OR "tumorigeneses"[Text Word] OR "Carcinogenesis"[Text Word] OR "Carcinogeneses"[Text Word] OR "invasion"[Text Word] OR "migration"[Text Word] OR "migrations"[Text Word] OR "invasions"[Text Word]</p> | 4,578,280 |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|

Database: Embase

Search date: 06/16/2021

| Group          | Keywords                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Results   |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1. Coronavirus | 'coronavirus'/exp/mj OR 'middle east respiratory syndrome coronavirus'/exp/mj OR 'sars virus'/exp/mj OR 'sars-cov-2'/exp/mj OR 'coronavirus nl63, human'/exp/mj OR 'coronavirus disease 2019'/exp/mj OR 'coronavirus':ti,ab,kw OR 'coronaviruses':ti,ab,kw OR 'middle east respiratory syndrome coronavirus':ti,ab,kw OR 'mers':ti,ab,kw OR 'mers-cov':ti,ab,kw OR 'severe acute respiratory syndrome virus':ti,ab,kw OR 'sars':ti,ab,kw OR 'sars-cov':ti,ab,kw OR 'severe acute respiratory syndrome coronavirus 2':ti,ab,kw OR 'sars-cov-2':ti,ab,kw OR 'sars-cov2':ti,ab,kw OR 'covid-19':ti,ab,kw OR '2019 novel coronavirus':ti,ab,kw OR '2019 novel coronaviruses':ti,ab,kw OR '2019 ncov':ti,ab,kw OR 'n-cov':ti,ab,kw OR 'wuhan coronavirus':ti,ab,kw OR 'coronavirus nl63':ti,ab,kw OR 'hcov-nl63':ti,ab,kw                                                                                                                                                                                                                    | 168,834   |
| 2. Cancer      | 'neoplasm'/exp/mj OR ('neoplasm':ti,ab,kw OR 'neoplasms':ti,ab,kw OR 'cancer':ti,ab,kw OR 'cancers':ti,ab,kw OR 'tumor':ti,ab,kw OR 'tumors':ti,ab,kw OR 'malignant':ti,ab,kw OR 'malignancy':ti,ab,kw OR malignancies:ti,ab,kw)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5,510,733 |
| 3. Biomarkers  | 'cytokines'/exp/mj OR 'chemokines'/exp/mj OR 'biological marker'/exp/mj OR 'cytokine':ti,ab,kw OR 'cytokines':ti,ab,kw OR 'chemokine':ti,ab,kw OR 'chemokines':ti,ab,kw OR 'biomarkers':ti,ab,kw OR 'biomarker':ti,ab,kw OR 'immune markers':ti,ab,kw OR 'immune marker':ti,ab,kw OR 'immunologic markers':ti,ab,kw OR 'immunologic marker':ti,ab,kw OR 'blood biomarker':ti,ab,kw OR 'blood biomarkers':ti,ab,kw OR 'serum biomarker':ti,ab,kw OR 'serum biomarkers':ti,ab,kw OR 'plasma biomarker':ti,ab,kw OR 'plasma biomarkers':ti,ab,kw OR 'plasma marker':ti,ab,kw OR 'plasma markers':ti,ab,kw OR 'serum marker':ti,ab,kw OR 'serum markers':ti,ab,kw OR 'blood marker':ti,ab,kw OR 'blood markers':ti,ab,kw OR 'blood indicator':ti,ab,kw OR 'blood indicators':ti,ab,kw OR 'serum indicator':ti,ab,kw OR 'serum indicators':ti,ab,kw OR 'plasma indicator':ti,ab,kw OR 'plasma indicators':ti,ab,kw OR 'plasma factors':ti,ab,kw OR 'plasma factor':ti,ab,kw OR 'serum factors':ti,ab,kw OR 'serum factor':ti,ab,kw OR 'blood | 1,618,076 |

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                        | <p>factors':ti,ab,kw OR 'blood factor':ti,ab,kw OR 'biological marker':ti,ab,kw<br/> OR 'biological markers':ti,ab,kw OR 'biologic marker':ti,ab,kw OR 'biologic<br/> markers':ti,ab,kw OR 'urine marker':ti,ab,kw OR 'urine markers':ti,ab,kw<br/> OR 'csf marker':ti,ab,kw OR 'csf markers':ti,ab,kw OR 'urine<br/> indicators':ti,ab,kw OR 'csf indicators':ti,ab,kw OR 'urine factor':ti,ab,kw<br/> OR 'urine factors':ti,ab,kw OR 'csf factor':ti,ab,kw OR 'csf factors':ti,ab,kw<br/> OR 'urine biomarker':ti,ab,kw OR 'urine biomarkers':ti,ab,kw OR 'csf<br/> biomarker':ti,ab,kw OR 'csf biomarkers':ti,ab,kw OR 'bronchoalveolar<br/> lavage fluid':ti,ab,kw OR 'bronchoalveolar lavage fluids':ti,ab,kw<br/> OR 'cerebrospinal fluid':ti,ab,kw OR 'cerebrospinal fluids':ti,ab,kw</p>                                                                                                                                                                                                                                                                              |           |
| 4. Disease progression | <p>'disease progression'/exp/mj OR 'prognosis'/exp/mj OR 'recurrence'/exp/mj<br/> OR 'epithelial mesenchymal transition'/exp/mj OR 'metastasis'/exp/mj<br/> OR 'disease progression':ti,ab,kw OR 'disease progressions':ti,ab,kw<br/> OR 'cancer progression':ti,ab,kw OR 'cancer progressions':ti,ab,kw<br/> OR 'tumor progression':ti,ab,kw OR 'tumor progressions':ti,ab,kw<br/> OR 'prognosis':ti,ab,kw OR 'prognoses':ti,ab,kw OR 'recurrence':ti,ab,kw<br/> OR 'recurrent':ti,ab,kw OR 'relapse':ti,ab,kw OR 'relapses':ti,ab,kw<br/> OR 'transform':ti,ab,kw OR 'transformation':ti,ab,kw<br/> OR 'transformations':ti,ab,kw OR 'emt':ti,ab,kw OR 'epithelial<br/> mesenchymal transition':ti,ab,kw OR 'stage':ti,ab,kw OR 'stages':ti,ab,kw<br/> OR 'metastasis':ti,ab,kw OR 'metastases':ti,ab,kw OR 'metastatic':ti,ab,kw<br/> OR 'tumorigenesis':ti,ab,kw OR 'tumorigenesis':ti,ab,kw<br/> OR 'carcinogenesis':ti,ab,kw OR 'carcinogenesis':ti,ab,kw<br/> OR 'invasion':ti,ab,kw OR 'migration':ti,ab,kw OR 'migrations':ti,ab,kw<br/> OR 'invasions':ti,ab,kw</p> | 4,386,803 |
| 1+2+3+4                | 1 AND 2 AND 3 AND 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 199       |

Database: Scopus

Search date: 06/16/2021

| Group                  | Keywords                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Results   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1. Coronavirus         | "coronavirus" OR "middle east respiratory syndrome coronavirus" OR "sars virus" OR "sars-cov-2" OR "coronavirus nl63, human" OR "coronavirus disease 2019" OR "coronavirus" OR "coronaviruses" OR "middle east respiratory syndrome coronavirus" OR "mers" OR "mers-cov" OR "severe acute respiratory syndrome virus" OR "sars" OR "sars-cov" OR "severe acute respiratory syndrome coronavirus 2" OR "sars-cov-2" OR "sars-cov2" OR "covid-19" OR "2019 novel coronavirus" OR "2019 novel coronaviruses" OR "2019 ncov" OR "n-cov" OR "wuhan coronavirus" OR "coronavirus nl63" OR "hcov-nl63"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 328,962   |
| 2. Cancer              | "neoplasm" OR "neoplasms" OR "cancer" OR "cancers" OR "tumor" OR "tumors" OR "malignant" OR "malignancy" OR "malignancies"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5,336,783 |
| 3. Biomarkers          | "cytokines" OR "chemokines" OR "biological marker" OR "cytokine" OR "cytokines" OR "chemokine" OR "chemokines" OR "biomarkers" OR "biomarker" OR "immune markers" OR "immune marker" OR "immunologic markers" OR "immunologic marker" OR "blood biomarker" OR "blood biomarkers" OR "serum biomarker" OR "serum biomarkers" OR "plasma biomarker" OR "plasma biomarkers" OR "plasma marker" OR "plasma markers" OR "serum marker" OR "serum markers" OR "blood marker" OR "blood markers" OR "blood indicator" OR "blood indicators" OR "serum indicator" OR "serum indicators" OR "plasma indicator" OR "plasma indicators" OR "plasma factors" OR "plasma factor" OR "serum factors" OR "serum factor" OR "blood factors" OR "blood factor" OR "biological marker" OR "biological markers" OR "biologic marker" OR "biologic markers" OR "urine marker" OR "urine markers" OR "csf marker" OR "csf markers" OR "urine indicators" OR "csf indicators" OR "urine factor" OR "urine factors" OR "csf factor" OR "csf factors" OR "urine biomarker" OR "urine biomarkers" OR "csf biomarker" OR "csf biomarkers" OR "bronchoalveolar lavage fluid" OR "bronchoalveolar lavage fluids" OR "cerebrospinal fluid" OR "cerebrospinal fluids" | 1,458,370 |
| 4. Disease progression | "disease progression" OR "prognosis" OR "recurrence" OR "epithelial mesenchymal transition" OR "metastasis" OR "disease progression" OR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 7,723,726 |

---

"disease progressions" OR "cancer progression" OR "cancer progressions"  
OR "tumor progression" OR "tumor progressions" OR "prognosis" OR  
"prognoses" OR "recurrence" OR "recurrent" OR "relapse" OR "relapses"  
OR "transform" OR "transformation" OR "transformations" OR "emt" OR  
"epithelial mesenchymal transition" OR "stage" OR "stages" OR  
"metastasis" OR "metastases" OR "metastatic" OR "tumorigenesis" OR  
"tumorigeneses" OR "carcinogenesis" OR "carcinogeneses" OR "invasion"  
OR "migration" OR "migrations" OR "invasions"

---

1+2+3+4

1 AND 2 AND 3 AND 4

1,017

---

**Table S2** Characteristics of eligible studies

| Author                | Type of study    | Study location | No. of total patients                  | Patient age (median) | Types of cancer              | Comparison groups                                                                                                                      | Biomarker measurement                                                 | Terminal outcome                                                                                                                             |
|-----------------------|------------------|----------------|----------------------------------------|----------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Abdul-Jawad et al.    | Research article | United Kingdom | Total:128                              | 61                   | Solid + Hematological cancer | Comparison 1:<br>COVID-19<br>Vs.<br>Non-COVID<br>(n =76)<br><br>Comparison 2 <sup>‡</sup> :<br>Cancer<br>Vs.<br>Non-cancer<br>(n = 93) | IL-6*; IL-8*; IL-10*                                                  | Comparison 1:<br>COVID-19 (N=41)<br>Alive: 32 (78.1%)<br>Death: 9 (21.9%)<br><br>Non-COVID-19<br>(N=35)<br>Alive: 35 (100%)<br>Death: 0 (0%) |
| Albiges et al.        | Research Article | France         | Total: 178<br>76 males<br>102 females  | 61                   | Solid + hematological cancer | Severity of COVID-19                                                                                                                   | Albumin; CRP*; D-dimer*; Ferritin;<br>Fibrinogen; LDH*; PCT; Troponin | Alive: 147<br>Cancer death: 11<br>COVID-19 death: 20                                                                                         |
| Cai et al.            | Research article | China          | Total: 2052<br>998 male<br>1054 female | 63                   | Solid + Hematological cancer | Cancer<br>Vs.<br>Non-cancer                                                                                                            | CRP; Ferritin*; IL-2R*; IL-6*; IL-8*;<br>IL-10*; PCT*; TNF- $\alpha$  | Cancer (N=93)<br>Alive: 70 (75.3%)<br>Death: 23 (24.7%)<br><br>Non-cancer<br>(N=1,959)<br>Alive: 1,747 (89.2%)<br>Death: 212 (10.8%)         |
| Martínez-López et al. | Research Article | Spain          | Total: 334<br>190 males<br>144 females | 71                   | Multiple myeloma             | Cancer<br>Vs.<br>Non-cancer                                                                                                            | D-dimer<br>Ferritin                                                   | Cancer (N=167)<br>Alive: 111 (66.5%)<br>Death: 56 (33.5%)                                                                                    |



|              |                  |               |                                        |      |                              |                                                                                                          |                                                                                                                                                                                                                                                                                                                |                                                                                                                                          |                                                               |
|--------------|------------------|---------------|----------------------------------------|------|------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
|              |                  |               |                                        |      |                              |                                                                                                          |                                                                                                                                                                                                                                                                                                                |                                                                                                                                          | Non-cancer (N=167)<br>Alive: 129 (77.2%)<br>Death: 38 (22.8%) |
| Meng et al.  | Research Article | China         | Total: 436<br>218 males<br>218 females | 62   | Solid + hematological cancer | Cancer Vs. Non-cancer                                                                                    | Albumin; ALT; Antithrombin activity*; aPTT*; AST; Bilirubin (Total); BUN; Complement 3; Complement 4; Creatinine; CRP*; D-dimer; ESR*; Ferritin*; Fibrinogen; FDP; Glucose; Hb*; hs-cTnl; IgA; IgG; IgM; IL-1β*; IL-2R*; IL-6*; IL-8; IL-10*; LDH; PCT*; Prothrombin time activity*; PT*; Thrombin time; TNF-α | Cancer (N=109)<br>Alive: 77 (70.6%)<br>Death: 32 (29.4%)<br>Non-cancer (N=327)<br>Alive: 287 (87.8%)<br>Death: 40 (12.2%)                |                                                               |
| Smith et al. | Research Article | United States | 86 females                             | 68.5 | Gynecologic cancer           | Comparison 1: Severe Vs. Moderate COVID-19 (n =86)<br>Comparison 2: Active cancer Vs. Remission (n = 86) | ALT; AST; Bilirubin (Total); Creatinine*; CRP*; D-dimer; Ferritin*; Fibrinogen; Hemoglobin*; Lactate*; LDH; PCT*; Troponin                                                                                                                                                                                     | Comparison 1 Severe (N=29)<br>Alive: 4 (13.8%)<br>Death: 25 (86.2%)<br>Comparison 2 Moderate (N=57)<br>Alive: 57 (100%)<br>Death: 0 (0%) |                                                               |
| Tian et al.  | Research Article | China         | Total: 751<br>372 males<br>379 females | 54   | Solid + hematological cancer | Comparison 1: Cancer Vs. Non-cancer                                                                      | Albumin*; Albumin-globulin ratio*; ALT*; aPTT*; AST*; CRP*; D-dimer; Globulin*; Hs-cTnl*; IL-2R*; IL-6*; IL-10*; INR*; LDH*; Myoglobin*;                                                                                                                                                                       | Comparison 1 Cancer (N=232)<br>Alive: 186 (80.2%)<br>Death: 46 (19.8%)                                                                   |                                                               |

|                 |                       |       |                                    |    |                                                                    |                             |                                                                                             |                                                                                                                  |
|-----------------|-----------------------|-------|------------------------------------|----|--------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
|                 |                       |       |                                    |    | (n = 751)                                                          |                             | NT-proBNP*; PCT*; PT*; TNF- $\alpha$ *;<br>Total protein*                                   | Non-cancer (N=519)<br>Alive: 463 (89.2%)<br>Death: 56 (10.8%)                                                    |
|                 |                       |       |                                    |    | Comparison 2:<br>Severe<br>Vs.<br>Non-severe<br>COVID<br>(n = 232) |                             |                                                                                             | Comparison 2<br>Severe (N=148)<br>Alive: 110 (74.3%)<br>Death: 38 (25.7%)                                        |
|                 |                       |       |                                    |    |                                                                    |                             |                                                                                             | Non-severe (N=84)<br>Alive: 76 (90.5%)<br>Death: 8 (9.5%)                                                        |
| Zahran et al.   | Research article      | Egypt | Total: 42<br>10 male<br>32 female  | 40 | Solid +<br>Hematological<br>cancer                                 | Cancer<br>Vs.<br>Non-cancer | Albumin*; ALT; AST*; Bilirubin;<br>Creatinine*; CRP*; D-dimer; Ferritin;<br>Hb*; LDH*; Urea | Cancer (N=23)<br>Alive: 23 (100%)<br>Death: 0 (0%)<br>Non-cancer (N=19)<br>Alive: 19 (100%)<br>Death: 0 (0%)     |
| Gallo et al.    | Letter to the Editor  | Italy | Total: 119<br>73 male<br>46 female | 69 | Solid +<br>Hematological<br>cancer                                 | Cancer<br>Vs.<br>Non-cancer | IL-1 $\beta$ ; IL-6; IL-8                                                                   | Cancer (N=18)<br>Alive: 18 (100%)<br>Death: 0 (0%)<br>Non-cancer (N=101)<br>Alive: 94 (93.1%)<br>Death: 7 (6.9%) |
| Villegas et al. | Letters to the Editor | Spain | Total: 5<br>3 males                | 62 | Hematological<br>cancer                                            | Treated with<br>Anakinra    | CCL2; CRP; CXCL10; D-dimer;<br>Ferritin; IL-1; IL-6; IL-7; IL-10; LDH                       | Alive: 0<br>Death: 5                                                                                             |

|                        |                              |           |                                     |    |                              |                                     |                                                                                                                                                                                                                                                |                                                                                                                     |
|------------------------|------------------------------|-----------|-------------------------------------|----|------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
|                        |                              |           | 2 females                           |    |                              |                                     |                                                                                                                                                                                                                                                |                                                                                                                     |
| Baumann et al.         | Correspondence               | Spain     | 4 males                             | 75 | Chronic lymphocytic leukemia | -                                   | CRP; D-dimer; Ferritin; LDH; PCT; Troponin I                                                                                                                                                                                                   | Alive: 4<br>Death: 0                                                                                                |
| Hatzl et al.           | Correspondence               | Australia | Total: 78<br>37 males<br>41 females | 65 | Hematological cancer         | Cancer Vs. Non-cancer               | CRP; Ferritin*; IL-6*                                                                                                                                                                                                                          | Cancer (N=8)<br>Alive: 7 (87.5%)<br>Death: 1 (12.5%)<br>Non-cancer (N=70)<br>Alive: 52 (74.3%)<br>Death: 18 (25.7%) |
| Pasin et al.           | Correspondence / Case report | Italy     | 1 male                              | 20 | NK/T-cell lymphoma           | -                                   | Bilirubin (Indirect); CRP; LDH                                                                                                                                                                                                                 | Alive: 1<br>Death: 0                                                                                                |
| Bellmann-Weiler et al. | Case report                  | Australia | 3 males                             | 63 | Hematological cancer         | Before Vs. After COVID-19 treatment | CRP; IL-6                                                                                                                                                                                                                                      | Alive: 3<br>Death: 0                                                                                                |
| da Costa et al.        | Case report                  | Brazil    | 1 male                              | 66 | Merkel cell carcinoma        | Treated with pembrolizumab          | Creatinine; CRP; D-dimer; LDH; Urea                                                                                                                                                                                                            | Alive: 1<br>Death: 0                                                                                                |
| Yekedüz et al.         | Case report                  | Turkey    | 1 female                            | 75 | Melanoma                     | Treated with nivolumab              | Albumin; ALP; ALT; AST; Bilirubin (Direct); Bilirubin (Total); Creatinine; CRP; D-dimer; GGT; LDH; PCT; Urea nitrogen; Uric acid                                                                                                               | Alive: 1<br>Death: 0                                                                                                |
| Zhang et al.           | Case report                  | China     | 1 male                              | 60 | Multiple myeloma             | Before Vs. After treatment          | Albumin; ALP; ALT; AST; Bilirubin (Total); CK; CK-MB; Creatinine; CRP; D-dimer; FDP; Fibrinogen; hs-TnI; IgA; IgG; IgM; IL-10; IL-2; IL-4; IL-6; LDH; PCT; TNF- $\alpha$ ; Uric acid; $\beta$ 2-microglobulin; $\kappa$ chain; $\lambda$ chain | Alive: 1<br>Death: 0                                                                                                |

\*The biomarkers are statistically significant at p-value < 0.05 in original studies. ALT, Alanine aminotransferase; aPTT, Activated partial thromboplastin time; AST, Aspartate aminotransferase; BUN, Blood urine nitrogen; CCL2, Chemokine C-C motif ligand 2; CK, Creatine kinase; CK-MB, Creatine kinase myocardial band; CRP, C-reactive protein; CXCL10, C-X-C motif chemokine ligand 10; ESR, Erythrocyte sedimentation rate; FDP, Fibrin degradation product; GGT, Gamma-glutamyl transferase; hs-cTnI, High-sensitivity cardiac troponin I; IgA, Immunoglobulin A; IgG, Immunoglobulin G; IgM, Immunoglobulin M; IL-10, Interleukin-10; IL-1 $\beta$ , Interleukin-1 $\beta$ ; IL-2R, Interleukin-2 receptor; IL-4, Interleukin-4; IL-6, Interleukin-6; IL-7, Interleukin-7; INR, International normalized ratio; LDH, Lactate dehydrogenase; NT-proBNP, N-terminal pro-B-type natriuretic peptide; PCT, Procalcitonin; TNF- $\alpha$ , Tumor necrosis factor  $\alpha$ .

**Table S3** REMARK Quality Questionnaire

| Item                                                                                                                                                                                                                                                                                                            | Yes                      | No                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| <b>1 Was the study prospective?</b><br>YES: The study reports that laboratory data of the cancer patients with COVID-19 were collected prior to the development of an outcome<br>NO: No report or clearly retrospective (e.g., The biomarkers of cancer patients with COVID-19 were collected after treatments) | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>2 Was the evaluation of biomarkers blinded to the patient outcome?</b><br>YES: The study reports an attempt to blind the person measuring the level of the biomarker to patient outcome<br>NO: There is no such report                                                                                       | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>3 Was there a defined time period during which patients were enrolled?</b><br>YES: Study defines time period, end of follow up period and median follow up time<br>NO: Does not define the above criteria                                                                                                    | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>4 Were there precisely defined clinical outcomes at the beginning of the study?</b><br>YES: Study defines which clinical endpoints are to be measured<br>NO: No such definition                                                                                                                              | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>5 Did the study provide a rationale for the study sample size?</b><br>YES: Evidence of a sensible sample size calculation (e.g., 10 outcomes/variable in a multiple regression model)<br>NO: No attempt to define sample size                                                                                | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>6 Did the study provide a list of candidate variables?</b><br>YES: A list of variables to be considered in multiple regression analysis is provided at the beginning of the study<br>NO: Evidence that variables were measured and not reported                                                              | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>7 Were the methods for measuring cancer or COVID-19 biomarkers adequately described and referenced?</b><br>YES<br>NO                                                                                                                                                                                         | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>8 Cases unselected/unbiased?</b><br>YES: No attempt to select patients with exclusion criteria<br>NO: Only a subset of cancer patients or COVID-19 patients enters the study                                                                                                                                 | <input type="checkbox"/> | <input type="checkbox"/> |

Adapted from “Blood biomarkers for physical recovery in ischemic stroke: a systematic review” by Lai et al., 2019, *Journal of Translational Research*,11(8), 4603–4613

**Table S4** Quality assessment scores to the included studies by using the modified REMARK questionnaire

| Article                | Q1    | Q2 | Q3    | Q4    | Q5   | Q6    | Q7    | Q8    | Score |
|------------------------|-------|----|-------|-------|------|-------|-------|-------|-------|
| Tian et al.            | -     | -  | +     | +     | +    | +     | +     | -     | 5     |
| Albiges et al.         | -     | -  | +     | +     | -    | +     | +     | -     | 4     |
| Zahran et al.          | +     | -  | +     | +     | -    | -     | +     | -     | 4     |
| Cai et al.             | -     | -  | +     | +     | -    | +     | -     | -     | 3     |
| Gallo et al.           | -     | -  | +     | -     | -    | +     | -     | +     | 3     |
| Martínez-López et al.  | -     | -  | +     | +     | -    | +     | -     | -     | 3     |
| Meng et al.            | -     | -  | +     | +     | -    | +     | -     | -     | 3     |
| Smith et al.           | -     | -  | +     | +     | -    | -     | +     | -     | 3     |
| Villegas et al.        | +     | -  | +     | -     | -    | -     | -     | +     | 3     |
| Abdul-Jawad et al.     | +     | -  | -     | -     | -    | +     | +     | -     | 2     |
| da Costa et al.        | -     | -  | +     | -     | -    | -     | -     | +     | 2     |
| Yekedüz et al.         | -     | -  | +     | -     | -    | -     | -     | +     | 2     |
| Zhang et al.           | -     | -  | +     | -     | -    | -     | -     | +     | 2     |
| Baumann et al.         | -     | -  | -     | -     | -    | -     | -     | +     | 1     |
| Bellmann-Weiler et al. | -     | -  | -     | -     | -    | -     | -     | +     | 1     |
| Hatzl et al.           | -     | -  | -     | -     | -    | -     | -     | +     | 1     |
| Pasin et al.           | -     | -  | -     | -     | -    | -     | -     | +     | 1     |
| Total percentage of +  | 17.6% | 0% | 70.6% | 41.2% | 5.9% | 41.2% | 29.4% | 52.9% |       |

**Table S5** Patients' characteristics from inclusion studies

| <b>Groups</b>             | <b>Items</b>                                     | <b>Numbers (%)</b> |
|---------------------------|--------------------------------------------------|--------------------|
| Patients                  | All patients                                     | 4,168 (100)        |
|                           | Male                                             | 2,022 (48.5)       |
|                           | Female                                           | 2,146 (51.5)       |
|                           | Cancer patients with COVID-19                    | 971 (23.3)         |
|                           | Non-COVID-19 patients with cancer                | 35 (0.8)           |
|                           | Non-cancer patients with COVID-19                | 3,162 (75.9)       |
|                           | Alive                                            | 3,569 (85.6)       |
|                           | Deceased                                         | 599 (14.4)         |
| Cancer<br>(Total = 1,002) | Multiple myeloma (MM)                            | 174 (17.4)         |
|                           | Gynecological cancer                             | 149 (14.9)         |
|                           | Gastrointestinal cancer                          | 121 (12.1)         |
|                           | Genitourinary cancer                             | 103 (10.3)         |
|                           | Other solid cancer                               | 96 (9.6)           |
|                           | Breast cancer                                    | 85 (8.5)           |
|                           | Thoracic cancer                                  | 58 (5.8)           |
|                           | Lymphoma                                         | 55 (5.5)           |
|                           | Head and neck cancer                             | 40 (4.0)           |
|                           | Thyroid cancer                                   | 40 (4.0)           |
|                           | Leukemia                                         | 32 (3.2)           |
|                           | Other hematological cancer                       | 29 (2.9)           |
|                           | Dermatological cancer                            | 15 (1.5)           |
|                           | Brain cancer                                     | 3 (0.3)            |
| Soft-tissue sarcoma       | 1 (0.1)                                          |                    |
| Bone cancer               | 1 (0.1)                                          |                    |
| Biomarkers                | All biomarkers                                   | 60 (100)           |
|                           | Changed significantly from cohort studies        | 29 (48.3)          |
|                           | Outside the reference interval from case reports | 14 (23.3)          |