Supplemental Digital Content 4: Newcastle Ottawa Scale (adapted for this systematic review)

Selection
1) Representativeness of the exposed cohort
   a) truly representative of the average ICU patient (*point given)
   b) somewhat representative of the average ICU patient (*point given)
   c) selected group
   d) no description of the derivation of the cohort

2) Selection of the non-exposed cohort
   a) drawn from the same community as the exposed cohort (*point given)
   b) drawn from a different source
   c) no description of the derivation of the non-exposed cohort

3) Ascertainment of exposure (i.e. of being vitamin D deficient)
   a) secure record - reliable assay for vitamin D status (*point given)
   b) Vitamin D status determined well before or after ICU admission
   c) no report of accuracy of vitamin D assay
   d) no description

4) Demonstration that outcome(s) of interest (e.g. mortality, LOS) was not present at start of study
   a) yes (*point given)
   b) no (for example if determined vitamin D level at time of discharge)

Comparability
1) Comparability of cohorts on the basis of the design or analysis
   a) study controls for Age (*point given)
   b) study controls for any additional factor * (point given)
   • will be study dependent, but could consider things like e.g. illness severity at admission, other measure of nutritional status

Outcome
1) Assessment of outcome
   a) independent assessment (*point given)
   b) record linkage (*point given)
   c) self-report
   d) no description

2) Was follow-up long enough for outcomes to occur
   a) yes – in hospital mortality (*point given)
   b) no (indicate no if mortality was only PICU mortality or unclear)

3) Adequacy of follow up of cohorts
   a) complete follow up - all subjects accounted for(*point given)
   b) subjects lost to follow up unlikely to introduce bias < 20 % (*point given)
   c) follow up rate < 80 % and no description of those lost
   d) no statement