**Supplementary Table 4** Reasoning for risk of bias assessment for mortality outcome

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| **Type of Bias** | **Reason for classification** |
| Bias due to confounding | Potential confounding due to diabetes and chronic renal failure cannot be ruled out for all studies. |
| Bias of selection of participants into the study | Scale et al., Hloch et al., and Doenyas-Barak et al., included patients into the study using a predetermined cut off for initial plasma lactate levels. Jochmans et al., excluded patients without arterial blood gas within 4 hours of ICU admission. |
| Bias in classification of interventions | For Scale et al., and Hloch et al., differential misclassification was present as the study population was not divided according to metformin use versus non-metformin use. Scale et al., divided patients according to Cohen and Woods classification of lactic acidosis, while Hloch et al., divided patients into known history of diabetes mellitus and metformin exposure. |
| Bias due to deviation from intended interventions | There were no systematic differences in care between the metformin and non-metformin groups in the included studies. |
| Bias due to missing data | There was no loss to follow up in the included studies. |
| Bias in measurement of outcomes | For Hloch et al., reporting of mortality was not entirely clear, requiring reclarification. |
| Bias in selection of the reported result | Due to the participant selection process, the studies conducted by Scale et al., Hloch et al., Doenyas-Barak et al., and Jochmans et al. are all at risk of bias resulting from selecting a subgroup from a larger cohort. |