

## Health Disparities in Acidosis Risks

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**Background:** Health disparities in acidosis risk are entangled with a range of factors including clinical conditions, genomic traits, and demographic features. Current clinical guidelines and policies on the safety of metformin have not yet taken holistic considerations of health disparities and other risk factors. The All of Us (AoU) research dataset provides comprehensive information including longitudinal real-world data for diseases and treatments, genetic data, and surveys for social determinants of health, with a focus on minority groups and the underserved population. This study leverages the AoU data to understand the health disparities in acidosis risk and provides real-world evidence to support clinical decisions.

**Methods:** A case-control design was used to identify risk factors associated with emergent acidosis events, with a 1:4 matching using propensity scores specified by enrollment date, number of diagnoses, and length of medical history. Risk factors were sex, age, race, ethnicity, metformin use, Charlson comorbidities, and insurance status. Adjusted odds ratios (aOR) were estimated using conditional logistic regression.

**Results:** The study includes the case group (n=2,666) and the control group (n=10,664). Health disparities were observed among participants. Compared with those who did not have health insurance, those with employer provided insurance (aOR: 0.49, 95%CI: 0.40 – 0.61), Medicare (aOR: 0.62, 95%CI: 0.52 – 0.74), or Medicaid (aOR: 0.80, 95%CI: 0.66 – 0.97) were less likely to develop acidosis. African Americans (aOR: 1.35, 95%CI: 1.15 – 1.58) showed higher acidosis risk. Other major risk factors include liver disease, renal disease, diabetes, and metformin use.

**Conclusion:** Health insurance coverage is a major determinant of acidosis risk. Patients with kidney and liver diseases or diabetes should be monitored carefully for signs of acidosis, especially if they have been prescribed metformin. In future work, for diabetes patients with both kidney and liver diseases, pharmacogenomics analysis will be performed for precision management of metformin-related acidosis risks.