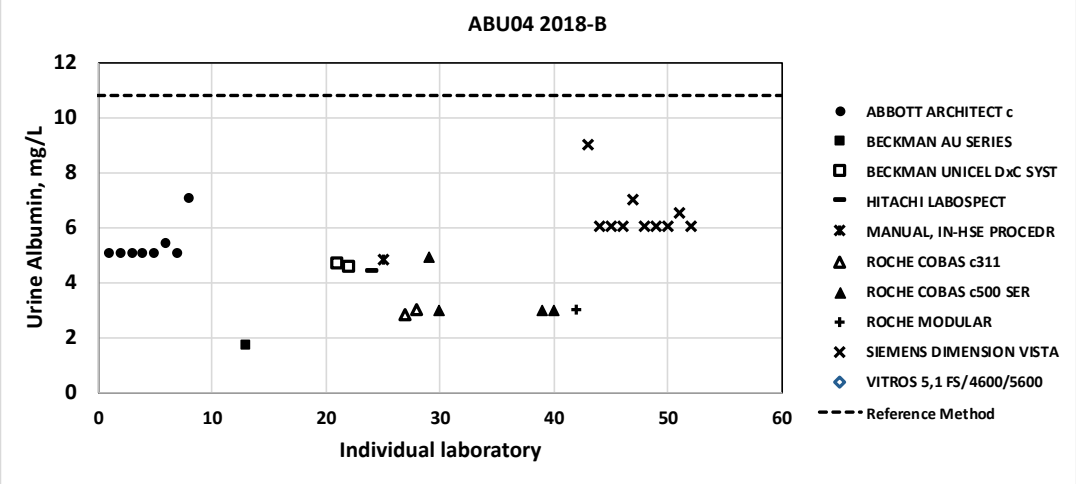
COLLEGE of AMERICAN PATHOLOGISTS

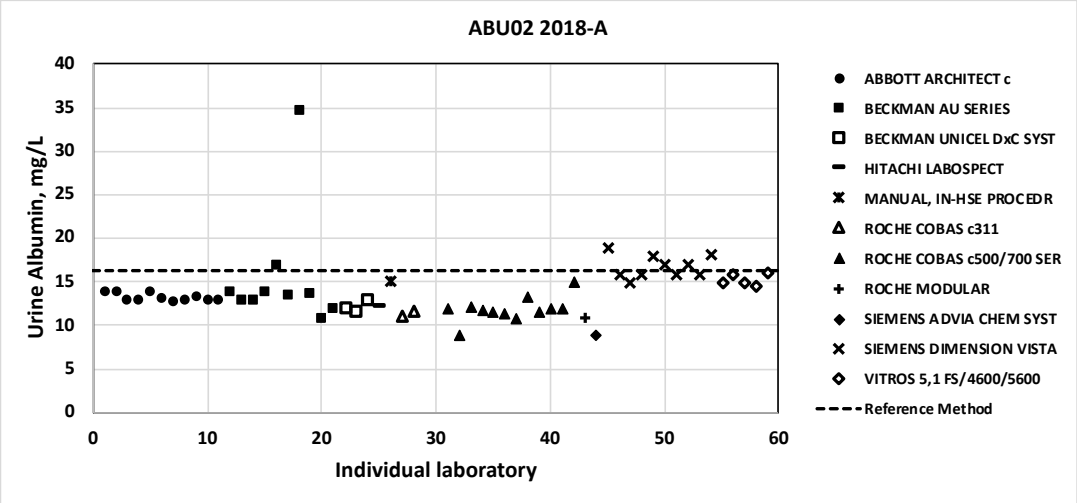
Educational Discussion: Accuracy Based Urine

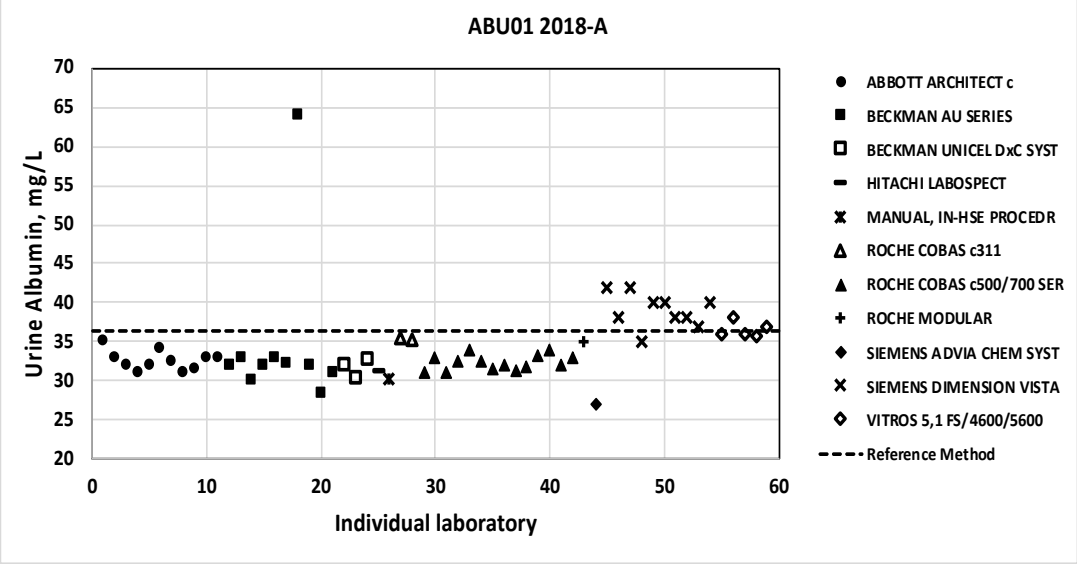
Performance of urine albumin in the ABU-A and ABU-B 2018 Surveys

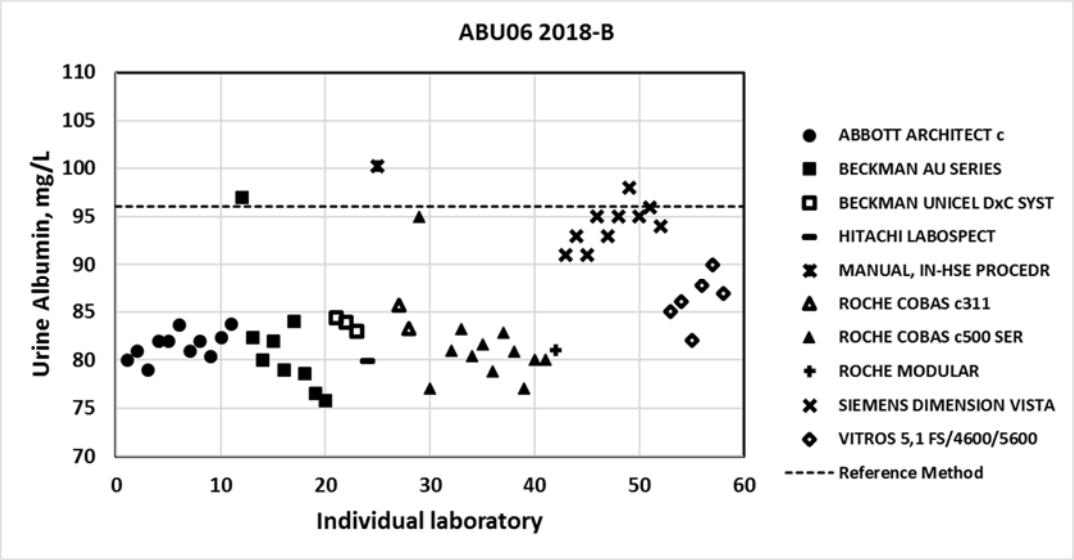
The ABU Survey includes 3 different fresh-frozen pooled urine samples in each mailing. The fresh-frozen pooled urine samples are from donors who had normal or elevated urine albumin. The urine was kept cold during collection and storage, pooled, filtered and frozen in aliquots at -70 °C within 5 days of collection. No supplements or preservatives were added. The fresh-frozen urine samples were allowed to thaw in transit to participants. The fresh-frozen urine samples are expected to be free of influence from matrix effects, and therefore comparisons made between participants' results, or among method group mean/median values, reflect performance expected for patients' samples.

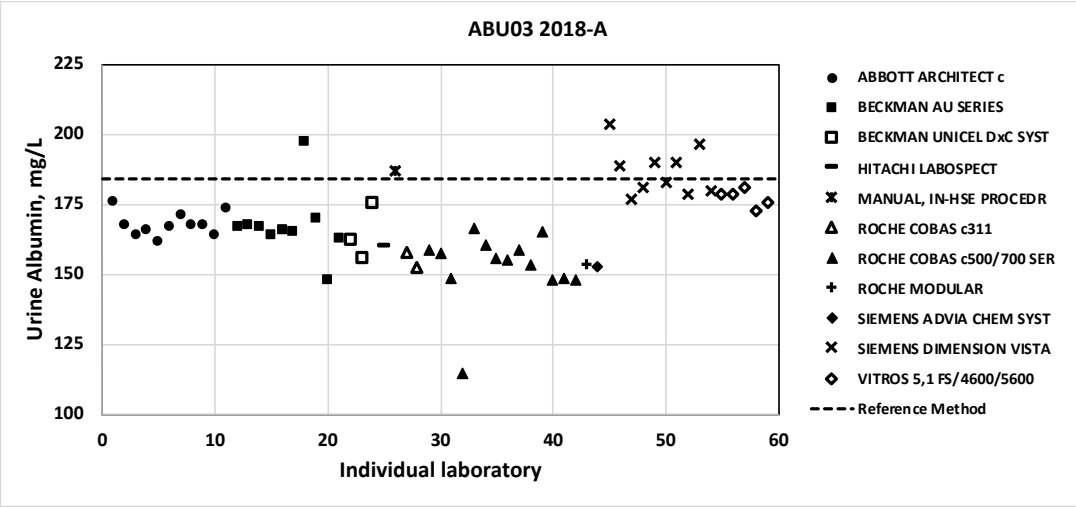
The figures that follow show urine albumin reported by individual laboratories arranged in order of increasing concentration for the 6 different urine samples from the A and B mailings in 2018. Missing points represent values that were below the AMR of the respective methods. The dotted line is the value from a candidate IDMS reference method performed by the Renal Testing Laboratory at Mayo Clinic. At the present time, there is not a certified reference material for albumin so the calibration of the candidate reference method is traceable to calibrators prepared from commercially available human albumin.

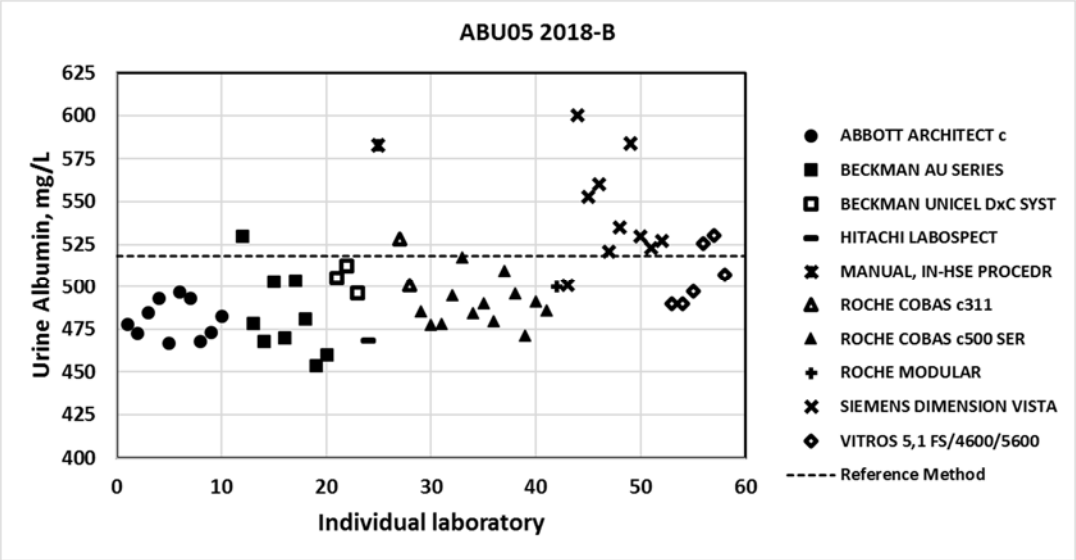



ABU02 2018-A
Urine Albumin, mg/L
Individual laboratory
0
5
10
15
20
25
30
35
40
0
10
20
30
40
50
60
ABBOTT ARCHITECT c
BECKMAN AU SERIES
BECKMAN UNICEL DxC SYST
HITACHI LABOSPECT
MANUAL, IN-HSE PROCEDR
ROCHE COBAS c311
ROCHE COBAS c500/700 SER
ROCHE MODULAR
SIEMENS ADVIA CHEM SYST
SIEMENS DIMENSION VISTA
VITROS 5,1 FS/4600/5600
Reference Method


ABU01 2018-A
Urine Albumin, mg/L
Individual laboratory
20
25
30
35
40
45
50
55
60
65
70
0
10
20
30
40
50
60
ABBOTT ARCHITECT c
BECKMAN AU SERIES
BECKMAN UNICEL DxC SYST
HITACHI LABOSPECT
MANUAL, IN-HSE PROCEDR
ROCHE COBAS c311
ROCHE COBAS c500/700 SER
ROCHE MODULAR
SIEMENS ADVIA CHEM SYST
SIEMENS DIMENSION VISTA
VITROS 5,1 FS/4600/5600
Reference Method


ABU06 2018-B
Urine Albumin, mg/L
110
105
100
95
90
85
80
75
70
0
10
20
30
40
50
60
Individual laboratory
ABBOTT ARCHITECT c
BECKMAN AU SERIES
BECKMAN UNICEL DxC SYST
HITACHI LABOSPECT
MANUAL, IN-HSE PROCEDR
ROCHE COBAS c311
ROCHE COBAS c500 SER
ROCHE MODULAR
SIEMENS DIMENSION VISTA
VITROS 5,1 FS/4600/5600
Reference Method


ABU03 2018-A
Urine Albumin, mg/L
225
200
175
150
125
100
0
10
20
30
40
50
60
Individual laboratory
ABBOTT ARCHITECT c
BECKMAN AU SERIES
BECKMAN UNICEL DxC SYST
HITACHI LABOSPECT
MANUAL, IN-HSE PROCEDR
ROCHE COBAS c311
ROCHE COBAS c500/700 SER
ROCHE MODULAR
SIEMENS ADVIA CHEM SYST
SIEMENS DIMENSION VISTA
VITROS 5,1 FS/4600/5600
Reference Method



The results for urine albumin from individual laboratories are reasonably consistent among methods used by laboratories 1-41 at all 6 concentrations, with results from Siemens Dimension Vista and Vitros methods higher than the others. At all but the lowest concentration of urine albumin, results from methods used by laboratories 1-41 appear lower than the candidate reference method, while results from Siemens Dimension Vista and Vitros are closer to those from the candidate reference method. At the very low urine albumin concentration of sample ABU-04, the results among those methods that can measure that concentration are in reasonably good agreement but lower than the candidate reference method value. For sample ABU-01, one laboratory using the Beckman AU series method had a value approximately double that of other laboratories suggesting an error in that laboratory not reflecting typical performance for that manufacturer's method.

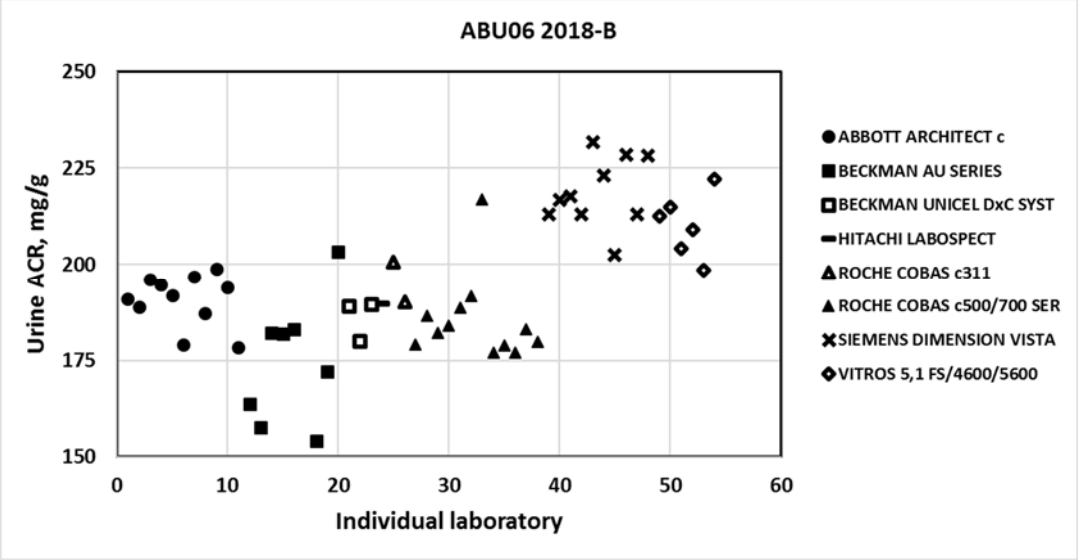
The Laboratory Working Group of the National Kidney Disease Education Program is collaborating with the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) Working Group for Standardization of Urine in Albumin to develop a standardization program for urine albumin measurements.

Other analytes in ABU-B

The results for urine calcium had good agreement among different methods. The results for urine protein had reasonably good agreement but the number of participants who reported values was small.

The results for urine creatinine had reasonably good agreement among different laboratories and methods. However, the results for urine albumin/creatinine ratio (ACR) had differences that were

primarily due to differences in urine albumin results. The figure that follows shows that fluctuation among laboratories and methods for urine ACR is somewhat greater than for urine albumin. The differences seen for laboratories using the Siemens Dimension Vista and Vitros methods reflect the differences in urine albumin results for sample ABU-06.



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Accuracy-Based Programs Committee