**Supplemental Table 1:** Comparison of parameters for MR protocols using moving rate of positive and negative patient results for each block size and each cut-off value.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Cut-off value | Block size | Mean | CV(%) | Lower control limit | Upper control limit | False rejection (%) |
|  |  | MR(positive) | MR(negative) | MR(positive) | MR(negative) | MR(positive) | MR(negative) | MR(positive) | MR(negative) | MR(positive) | MR(negative) |
| 2 log10 IU/mL | 20 | 0.4098  | 0.5902  | 38.5617  | 26.7736  | -0.0643  | 0.1161  | 0.8839  | 1.0643  | 0.4137  | 0.4137  |
| 50 | 0.4097  | 0.5903  | 23.5332  | 16.3312  | 0.1201  | 0.3011  | 0.6986  | 0.8196  | 0.4410  | 0.4410  |
| 100 | 0.4094  | 0.5905  | 17.6456  | 12.2361  | 0.1927  | 0.3737  | 0.6263  | 0.8073  | 0.3987  | 0.3987  |
| 200 | 0.4093  | 0.5907  | 14.1426  | 9.7988  | 0.2356  | 0.4171  | 0.5829  | 0.7644  | 0.6322  | 0.6322  |
| 500 | 0.4089  | 0.5911  | 11.5873  | 8.0164  | 0.2668  | 0.4489  | 0.5511  | 0.7332  | 0.3023  | 0.3023  |
| 1000 | 0.4085  | 0.5915  | 10.1429  | 7.0059  | 0.2842  | 0.4672  | 0.5328  | 0.7158  | 0.2920  | 0.2920  |
| 3 log10 IU/mL | 20 | 0.3091  | 0.6909  | 42.4634  | 18.9959  | -0.0847  | 0.2972  | 0.7028  | 1.0847  | 0.2946  | 0.2946  |
| 50 | 0.3089  | 0.6911  | 25.4243  | 11.3653  | 0.0733  | 0.4554  | 0.5446  | 0.9267  | 0.3735  | 0.3735  |
| 100 | 0.3087  | 0.6913  | 18.3602  | 8.1993  | 0.1387  | 0.5212  | 0.4788  | 0.8613  | 0.6533  | 0.6533  |
| 200 | 0.3085  | 0.6915  | 14.1238  | 6.3019  | 0.1778  | 0.5607  | 0.4393  | 0.8222  | 0.5712  | 0.5712  |
| 500 | 0.3082  | 0.6918  | 10.7879  | 4.8068  | 0.2085  | 0.5920  | 0.4080  | 0.7915  | 0.1046  | 0.1046  |
| 1000 | 0.3079  | 0.6921  | 8.9296  | 3.9721  | 0.2254  | 0.6096  | 0.3904  | 0.7746  | 0.0000  | 0.0000  |
| 4 log10 IU/mL | 20 | 0.2060  | 0.7940  | 50.9148  | 13.2108  | -0.1087  | 0.4793  | 0.5207  | 1.1087  | 0.3395  | 0.3395  |
| 50 | 0.2059  | 0.7941  | 31.2851  | 8.1124  | 0.0127  | 0.6008  | 0.3992  | 0.9873  | 0.4703  | 0.4703  |
| 100 | 0.2058  | 0.7942  | 22.6948  | 5.8817  | 0.0657  | 0.6540  | 0.3460  | 0.9343  | 0.3829  | 0.3829  |
| 200 | 0.2057  | 0.7943  | 17.1474  | 4.4406  | 0.0999  | 0.6885  | 0.3115  | 0.9001  | 0.3612  | 0.3612  |
| 500 | 0.2054  | 0.7946  | 12.7329  | 3.2917  | 0.1270  | 0.7161  | 0.2839  | 0.8730  | 0.0250  | 0.0250  |
| 1000 | 0.2051  | 0.7949  | 10.2755  | 2.6517  | 0.1419  | 0.7316  | 0.2684  | 0.8581  | 0.0000  | 0.0000  |
| 5 log10 IU/mL | 20 | 0.1469  | 0.8531  | 59.9837  | 10.3270  | -0.1174  | 0.5888  | 0.4112  | 1.1174  | 0.3575  | 0.3575  |
| 50 | 0.1468  | 0.8532  | 37.6800  | 6.4835  | -0.0191  | 0.6872  | 0.3128  | 1.0191  | 0.3105  | 0.3105  |
| 100 | 0.1467  | 0.8533  | 27.4875  | 4.7274  | 0.0257  | 0.7322  | 0.2678  | 0.9743  | 0.4821  | 0.4821  |
| 200 | 0.1467  | 0.8533  | 20.5028  | 3.5239  | 0.0565  | 0.7631  | 0.2369  | 0.9435  | 0.2958  | 0.2958  |
| 500 | 0.1464  | 0.8536  | 15.0141  | 2.5756  | 0.0805  | 0.7876  | 0.2124  | 0.9195  | 0.0023  | 0.0023  |
| 1000 | 0.1462  | 0.8538  | 12.0879  | 2.0697  | 0.0932  | 0.8008  | 0.1992  | 0.9068  | 0.0000  | 0.0000  |
| 6 log10 IU/mL | 20 | 0.1018  | 0.8982  | 71.7060  | 8.1237  | -0.1171  | 0.6793  | 0.3207  | 1.1171  | 0.5779  | 0.5779  |
| 50 | 0.1017  | 0.8983  | 45.3788  | 5.1380  | -0.0368  | 0.7598  | 0.2402  | 1.0368  | 0.2903  | 0.2903  |
| 100 | 0.1016  | 0.8984  | 32.7410  | 3.7042  | 0.0018  | 0.7985  | 0.2015  | 0.9982  | 0.3086  | 0.3086  |
| 200 | 0.1016  | 0.8984  | 23.9442  | 2.7064  | 0.0286  | 0.8255  | 0.1745  | 0.9714  | 0.2980  | 0.2980  |
| 500 | 0.1014  | 0.8986  | 16.9794  | 1.9151  | 0.0497  | 0.8470  | 0.1530  | 0.9503  | 0.5296  | 0.5296  |
| 1000 | 0.1011  | 0.8989  | 13.5422  | 1.5239  | 0.0601  | 0.8578  | 0.1422  | 0.9399  | 0.1517  | 0.1517  |
| 7 log10 IU/mL | 20 | 0.0711  | 0.9289  | 85.0087  | 6.5025  | -0.1102  | 0.7477  | 0.2523  | 1.1102  | 0.3328  | 0.3328  |
| 50 | 0.0710  | 0.9290  | 53.3945  | 4.0824  | -0.0427  | 0.8152  | 0.1848  | 1.0427  | 0.3825  | 0.3825  |
| 100 | 0.0710  | 0.9290  | 37.8797  | 2.8938  | -0.0097  | 0.8484  | 0.1516  | 1.0097  | 0.2208  | 0.2208  |
| 200 | 0.0709  | 0.9291  | 27.4711  | 2.0966  | 0.0125  | 0.8707  | 0.1293  | 0.9875  | 0.2258  | 0.2258  |
| 500 | 0.0708  | 0.9292  | 19.0323  | 1.4501  | 0.0304  | 0.8888  | 0.1112  | 0.9696  | 0.2978  | 0.2978  |
| 1000 | 0.0707  | 0.9293  | 15.1289  | 1.1506  | 0.0386  | 0.8972  | 0.1028  | 0.9614  | 0.5035  | 0.5035  |

 CV, coefficient of variation; MR, moving rate; MR (positive): moving rate of positive patient results; MR (negative): moving rate of negative patient results.

**Supplemental Table 2**: Probabilities of triggering 2:2S and 1:3S rules when a positive bias of 0.4 log10 IU/mL appears at two QC concentrations

|  |  |  |
| --- | --- | --- |
| QC Concentration level | 3.44 log10 IU/mL | 5.43 log10 IU/mL |
| CVa | 4.61% | 3.21% |
| Citical bias | 0.4 log10 IU/mL | 0.4 log10 IU/mL |
| Probability of triggering 2 : 2S rule | 46.25% | 36.99% |
| Probability of triggering 1 : 3S rule | 33.44% | 25.57% |

QC, quality control

**Supplemental Table 3**: The minimum concentration levels of QC material for detecting a 0.4 log10 IU/mL shift using 2:2S and 1:3S rules with 95% probability

|  |  |  |
| --- | --- | --- |
| QC rules | 2:2S rule | 1:3S rule |
| Critical bias | 0.4 log10 IU/mL | 0.4 log10 IU/mL |
| CVa | 4.61% | 4.61% |
| Desired detection power | 95% | 95% |
| Minimum concentration level | 2.00 log10 IU/mL | 1.73 log10 IU/mL |

QC, quality control