**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