

Supporting Information-

Rapid classification of COVID-19 severity by ATR-FTIR Spectroscopy of plasma samples

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Table S1-Clinical data of Nonsevere samples n= 78 used for predictive model building

| Sr. No. | Reg No | Plasma No. | Age | Sex | Comorbidity | Oxygen saturation | Severity | Respiratory Illness |
|---------|--------|------------|-----|-----|-------------------------------------|----------------------------------|-----------|-------------------------------|
| 1 | 7194 | P8 | 42 | F | Diabetes mellitus, Hypertension | 95% | Nonsevere | No |
| 2 | 8875 | P291 | 52 | F | Hypertension | 99% | Nonsevere | No |
| 3 | 8878 | P292 | 65 | M | Hypertension | 92% | Nonsevere | No |
| 4 | 8885 | P293 | 67 | M | Hypertension | 96% | Nonsevere | No |
| 5 | 8892 | P294 | 48 | F | No | 99% | Nonsevere | No |
| 6 | 8896 | P295 | 22 | F | No | 97% without o ₂ | Nonsevere | No |
| 7 | 8917 | P296 | 76 | M | Hypertension, Diabetes mellitus | 100% | Nonsevere | No |
| 8 | 8848 | P299 | 37 | M | No | 96% | Nonsevere | No |
| 9 | 8908 | P300 | 61 | F | Hypertension | 84%, 96% on 5 lit o ₂ | Nonsevere | No |
| 10 | 8909 | P301 | 30 | F | Deaf & Mute | 99% RA | Nonsevere | No |
| 11 | 8910 | P302 | 65 | F | Hypertension | 98% RA | Nonsevere | No |
| 12 | 8911 | P303 | 24 | F | Diabetes mellitus | 98% RA | Nonsevere | No |
| 13 | 8916 | P304 | 53 | F | No | 97% RA | Nonsevere | No |
| 14 | 8915 | P305 | 51 | F | Hypertension, Diabetes mellitus | 99% | Nonsevere | Bilateral Maxillary Sinusitis |
| 15 | 8920 | P306 | 59 | F | Hypertension | 98% | Nonsevere | No |
| 16 | 8921 | P307 | 30 | M | No | 97% | Nonsevere | No |
| 17 | 8935 | P308 | 51 | F | Hypertension | 87 RA | Nonsevere | No |
| 18 | 8923 | P309 | 60 | M | Diabetes mellitus | 94% | Nonsevere | No |
| 19 | 8730 | P311 | 40 | M | No | 96% on 2 lit o ₂ | Nonsevere | No |
| 20 | 8783 | P312 | 27 | M | No | 99% | Nonsevere | No |
| 21 | 8788 | P313 | 46 | M | No | 97% | Nonsevere | No |
| 22 | 8793 | P314 | 28 | M | No | 98% | Nonsevere | No |
| 23 | 8864 | P322 | 42 | M | Hypertension, Asthma, Heart Disease | 97% | Nonsevere | No |
| 24 | 9031 | P326 | 53 | M | Hypertension | 91% of o ₂ | Nonsevere | No |
| 25 | 9045 | P329 | 59 | F | Diabetes mellitus, Hypertension | 98% RA | Nonsevere | No |
| 26 | 9048 | P330 | 69 | M | Diabetes mellitus, Hypertension | 98% | Nonsevere | No |
| 27 | 9051 | P331 | 72 | F | Hypertension | 92% | Nonsevere | No |
| 28 | 9052 | P323 | 56 | M | No | 99% | Nonsevere | No |
| 29 | 9052 | P332 | 56 | M | No | 99% | Nonsevere | No |
| 30 | 9063 | P333 | 25 | M | No | 97% RA | Nonsevere | No |
| 31 | 8885 | P339 | 67 | M | Hypertension | 96% | Nonsevere | No |
| 32 | 8910 | P340 | 65 | F | Hypertension | 98% RA | Nonsevere | No |

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|----|------|------|----|---|--|------------------|-----------|----|
| 33 | 8962 | P341 | 50 | M | No | 96% | Nonsevere | No |
| 34 | 9007 | P344 | 60 | M | Asthma | 92% | Nonsevere | No |
| 35 | 9058 | P346 | 30 | M | Posterior anal abscess and fistula in ANO | 99% | Nonsevere | No |
| 36 | 9082 | P347 | 64 | F | Hypertension, Diabetes mellitus, Was thyphoid +ve recently | 98% RA | Nonsevere | No |
| 37 | 9083 | P348 | 67 | F | No | 98% RA | Nonsevere | No |
| 38 | 9084 | P349 | 48 | F | No | 100% | Nonsevere | No |
| 39 | 9064 | P334 | 65 | M | Diabetes mellitus | 98% on 10 lit o2 | Nonsevere | No |
| 40 | 9318 | P432 | 35 | F | Diabetes mellitus (only in pregnancy) | 98% RA | Nonsevere | No |
| 41 | 9115 | P634 | 79 | M | No | 98% | Nonsevere | No |
| 42 | 9088 | P350 | 38 | M | Hypertension | 98% RA | Nonsevere | No |
| 43 | 9104 | P351 | 36 | F | Hyperthyroid | 98% RA | Nonsevere | No |
| 44 | 9105 | P352 | 22 | M | No | 98% RA | Nonsevere | No |
| 45 | 9208 | P358 | 37 | M | No | 98% | Nonsevere | No |
| 46 | 9115 | P364 | 79 | F | No | 98% RA | Nonsevere | No |
| 47 | 9190 | P365 | 43 | M | No | 98% | Nonsevere | No |
| 48 | 9209 | P367 | 65 | F | No | 98% | Nonsevere | No |
| 49 | 9200 | P368 | 58 | M | No | 98% | Nonsevere | No |
| 50 | 9202 | P370 | 29 | M | No | 99% | Nonsevere | No |
| 51 | 9195 | P371 | 47 | M | Bronchitis (6 months back) | 99% RA | Nonsevere | No |
| 52 | 9189 | P372 | 38 | M | No | 99% RA | Nonsevere | No |
| 53 | 9253 | P375 | 32 | M | No | 98% RA | Nonsevere | No |
| 54 | 9250 | P376 | 49 | M | Diabetes mellitus | 96% | Nonsevere | No |
| 55 | 9257 | P377 | 42 | M | No | 98% | Nonsevere | No |
| 56 | 9313 | P421 | 76 | M | Hypertension, Thyroid | 95% RA | Nonsevere | No |
| 57 | 9320 | P422 | 77 | M | Hypertension | 98% RA | Nonsevere | No |
| 58 | 9200 | P424 | 58 | M | No | 98% | Nonsevere | No |
| 59 | 9329 | P425 | 66 | M | No | 98% | Nonsevere | No |
| 60 | 9306 | P430 | 52 | M | No | 98% | Nonsevere | No |
| 61 | 9506 | P492 | 68 | M | No | 98% | Nonsevere | No |
| 62 | 9498 | P499 | 70 | M | Hypertension | 96% RA | Nonsevere | No |
| 63 | 9523 | P504 | 41 | M | No | 98% | Nonsevere | No |
| 64 | 9536 | P505 | 35 | M | No | 98% | Nonsevere | No |
| 65 | 9524 | P507 | 68 | M | Diabetes mellitus, Hypertension | 98% | Nonsevere | No |
| 66 | 9447 | P517 | 55 | M | Hypertension | 98% | Nonsevere | No |
| 67 | 9458 | P518 | 47 | F | No | 99% | Nonsevere | No |
| 68 | 9530 | P520 | 63 | M | No | 98% | Nonsevere | No |
| 69 | 9526 | P521 | 26 | M | No | 98% RA | Nonsevere | No |
| 70 | 9554 | P526 | 45 | M | No | 99% | Nonsevere | No |
| 71 | 9582 | P527 | 46 | M | No | 99% | Nonsevere | No |

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|----|------|------|----|---|------------------------------------|---------|-----------|----|
| 72 | 9590 | P531 | 59 | F | Diabetes mellitus, Hypertension | 96% | Nonsevere | No |
| 73 | 9572 | P535 | 40 | M | No | 98 % RA | Nonsevere | No |
| 74 | 9483 | P536 | 24 | M | No | 98% RA | Nonsevere | No |
| 75 | 9510 | P537 | 47 | M | No | 98% RA | Nonsevere | No |
| 76 | 9601 | P538 | 37 | M | No | 98% | Nonsevere | No |
| 77 | 9588 | P540 | 37 | M | No | 98% RA | Nonsevere | No |
| 78 | 9614 | P541 | 55 | M | Diabetes mellitus | 99% | Nonsevere | No |

Table S2- Clinical data of severe samples n= 52 used for predictive model building

| Sr. No. | Reg No | Plasma No. | Age | Sex | Comorbidity | Oxygen saturation | Severity | Respiratory Illness |
|---------|--------|------------|-----|-----|--|---|----------|---|
| 1 | 7777 | P286 | 58 | F | Diabetes mellitus, Hypertension | 50%, 91% on 10 lit o ₂ | Severe | Bilateral non homogenous opacities present in both lungs (lower lobes), B/L Pneumonia |
| 2 | 8728 | P287 | 40 | M | No | 75%, 90% on 12 lit o ₂ | Severe | B/LPneumonia |
| 3 | 8833 | P288 | 75 | M | No | 84% RA | Severe | Cardiovascular arrest - B/LPneumonia (due to Covid- 19) |
| 4 | 8838 | P289 | 52 | M | Hypertension, Diabetes mellitus | 92% on 15 lit o ₂ | Severe | Severe B/LPneumonia (due to Covid-19) |
| 5 | 8857 | P290 | 70 | F | No | 92% | Severe | B/L Pneumonia |
| 6 | 8491 | P298 | 56 | F | Hypertension, Diabetes mellitus | 87%, 99% on 5 lit o ₂ | Severe | B/LPneumonia |
| 7 | 8684 | P310 | 75 | M | Hypertension, Diabetes mellitus, IHD (Hip bones) | 63% RA | Severe | B/L Pneumonia |
| 8 | 8819 | P315 | 43 | M | Diabetes mellitus, Hypertension, Dyslipidemia | 75% on air, 97% on 15 lit o ₂ | Severe | B/L Pneumonia |
| 9 | 8795 | P316 | 62 | M | Diabetes mellitus | 96% RA | Severe | B/L Pneumonia |
| 10 | 8946 | P317 | 51 | F | Hypertension | 97% RA | Severe | B/L Pneumonia with Malaria Falciparum |
| 11 | 8946 | P297 | 51 | F | Hypertension | 97% RA | Severe | B/L Pneumonia with Malaria Falciparum |
| 12 | 8852 | P318 | 70 | M | Hypertension, Diabetes mellitus | 88% | Severe | B/L Pneumonia |
| 13 | 8717 | P321 | 53 | M | Hypertension, Diabetes mellitus | 90% RA | Severe | B/L Pneumonia |
| 14 | 9014 | P324 | 42 | F | No | 68% | Severe | ARDS (B/LPneumonia) due to Covid-19 (cause of death) |
| 15 | 9030 | P325 | 77 | M | Hypertension, Diabetes mellitus, TB | 73% on o ₂ , 95% on 10 lit o ₂ | Severe | Type I Respiratory Failure with B/L Pneumonia with Dengue |
| 16 | 9033 | P327 | 62 | M | Hypertension | 78% | Severe | B/L Pneumonia |
| 17 | 8773 | P328 | 73 | M | Hypertension, Diabetes mellitus | 84% | Severe | B/L Pneumonia |

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|----|------|------|----|---|---|------------------------------|--------|---|
| 18 | 7242 | P336 | 34 | M | No | 90% | Severe | ARDS, Respiratory Failure due to chronic fibrobronchitis with critical care neuropathy (cause of death), B/L Pneumonia |
| 19 | 9023 | P345 | 63 | M | No | 90% | Severe | B/LPneumonia, Cardio respiratory arrest |
| 20 | 9064 | P359 | 65 | M | Diabetes mellitus | 98% on 10 lit o2 RR 30/min | Severe | No |
| 21 | 9023 | P360 | 63 | M | No | 90% | Severe | B/LPneumonia, Cardio respiratory arrest (cause of death) |
| 22 | 9144 | P361 | 40 | M | Chronic alcoholic (alcohol withdrawal) | 97% on 6 lit o2 | Severe | Respiratory failure due to ARDS |
| 23 | 8707 | P363 | 69 | M | Hypertension | 90% without o2 | Severe | B/L Pneumonia, B/L Pedal Edema |
| 24 | 8707 | P378 | 69 | M | Hypertension | 90% without o2 | Severe | B/L Pneumonia, B/L Pedal Edema |
| 25 | 9330 | P419 | 65 | F | Hypertension | 66%, 88% on 15 lit o2 | Severe | B/LPneumonia |
| 26 | 8819 | P420 | 43 | F | Diabetes mellitus, Hypertension, Dyslipidemia | 75% on air, 97% on 15 lit o2 | Severe | B/LPneumonia |
| 27 | 9327 | P428 | 68 | M | Diabetes mellitus | 95% RA | Severe | ARDS with B/L Pneumonia |
| 28 | 9014 | P429 | 42 | M | No | 68% | Severe | ARDS Type I RF due to B/LPneumonia (cause of death) |
| 29 | 8838 | P468 | 52 | F | Hypertension, Diabetes mellitus | 92% on 15 lit o2 | Severe | Severe B/LPneumonia |
| 30 | 9238 | P477 | 77 | M | Diabetes mellitus | 98% RA | Severe | Septisemia with ARDS Type I RF, B/L Pneumonia |
| 31 | 9288 | P494 | 63 | M | Diabetes mellitus, Hypertension | 98% RA | Severe | B/LPneumonia |
| 32 | 8844 | P495 | 42 | M | No | 99% | Severe | B/L Pneumonia |
| 33 | 9258 | P496 | 51 | F | No | 94% | Severe | ARDS B/L Pneumonia |
| 34 | 9290 | P497 | 77 | F | Hypertension | 98% RA | Severe | B/L Pneumonia |
| 35 | 9346 | P502 | 59 | F | Chronic Alcoholic | 97% RA | Severe | Covid-19 Pneumonia |
| 36 | 9238 | P503 | 77 | F | Diabetes mellitus | 98% RA | Severe | Septisemia with ARDS Type I RF, B/L Pneumonia, B/L Pedal Edema |
| 37 | 9448 | P506 | 50 | M | Diabetes mellitus | 92% RA | Severe | Covid-19 Pneumonia |
| 38 | 9529 | P509 | 32 | M | No | 97% | Severe | B/LPneumonia |
| 39 | 9144 | P514 | 40 | M | Chronic alcoholic (alcohol withdrawal) | 97% on 6 lit o2 | Severe | Respiratory failure due to ARDS |
| 40 | 9448 | P522 | 50 | M | Diabetes mellitus | 92% RA | Severe | Covid-19 Pneumonia |
| 41 | 9529 | P528 | 32 | M | No | 97% | Severe | B/LPneumonia |
| 42 | 9290 | P530 | 77 | F | Hypertension | 98% RA | Severe | B/L Pneumonia |
| 43 | 9238 | P533 | 77 | M | Diabetes mellitus | 98% RA | Severe | Septisemia with ARDS Type I RF, B/L Pneumonia |

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|----|------|------|----|---|---------------------------------|---------------------------|--------|--|
| 44 | 9238 | P559 | 77 | F | Diabetes mellitus | 98% RA | Severe | Septisemia with ARDS Type I RF, B/L Pneumonia |
| 45 | 9172 | P442 | 40 | M | No | 92% on 3 lit o2 | Severe | ARDS Type I RF due to B/L Pneumonia |
| 46 | 9368 | P576 | 64 | F | Hypertension | 75% RA, 92% on 15 lit o2, | Severe | Septisemia with Septic shock in case of Covid-19 Bilateral pneumonia |
| 47 | 9669 | P579 | 50 | F | Hypertension | 87% | Severe | ARDS due to B/L Pneumonia |
| 48 | 9700 | P592 | 64 | F | Diabetes mellitus | 69% | Severe | ARDS in Ischaemic heart, B/L Pneumonia |
| 49 | 9544 | P609 | 73 | M | Diabetes mellitus, Hypertension | 95% RA | Severe | B/L Pneumonia |
| 50 | 9258 | P625 | 57 | M | No | 94% | Severe | ARDS B/L Pneumonia |
| 51 | 9888 | P676 | 54 | F | Diabetes mellitus, Hypertension | 70% | Severe | ARDS B/L Pneumonia |
| 52 | 8791 | P338 | 48 | M | Diabetes mellitus, Hypertension | 93% | Severe | B/LPneumonia |

Table S3- Clinical data of Nonsevere samples n= 13 used for testing the model

| Sr . No | Registration No | Plasma ID | AGE | Sex | Status | Comorbidity | Oxygen saturation | Respiratory Illness |
|---------|-----------------|-----------|-----|-----|-----------|-----------------------------------|-------------------|---------------------|
| 1 | 9957 | P679 | 36 | F | Nonsevere | Hypothyroidism | 97% SPO2 on RA | No |
| 2 | 9554 | P436 | 45 | M | Nonsevere | No | 0.99 | No |
| 3 | 9325 | P438 | 48 | M | Nonsevere | No | 96% on RA | No |
| 4 | 9326 | P439 | 42 | M | Nonsevere | No | 98% on RA | No |
| 5 | 9335 | P440 | 38 | F | Nonsevere | No | 97% on RA | No |
| 6 | 9298 | P441 | 53 | M | Nonsevere | No | 98% on RA | No |
| 7 | 9337 | P448 | 45 | M | Nonsevere | Diabetes Mellitus & Hypertension | 0.95 | No |
| 8 | 9626 | P552 | 36 | F | Nonsevere | No | 0.99 | No |
| 9 | 9660 | P574 | 51 | M | Nonsevere | No | 0.98 | No |
| 10 | 9662 | P575 | 18 | M | Nonsevere | No | 0.99 | No |
| 11 | 9666 | P577 | 65 | M | Nonsevere | No | 1 | No |
| 12 | 9804 | P626 | 46 | F | Nonsevere | No | 0.98 | No |
| 13 | 9531 | P699 | 69 | M | Nonsevere | Diabetes Mellitus & Heart Disease | 99% on 4lit O2 | None |

Table S4- Clinical data of Severe samples n= 17 used for testing the model

| Sr. No | Registration No | Plasma ID | AGE | Sex | Status | Comorbidity | Oxygen saturation | Respiratory Illness |
|---------------|------------------------|------------------|------------|------------|---------------|----------------------------------|--------------------------|----------------------------|
| 1 | 9349 | P437 | 63 | M | Severe | No | 0.94 | b/l pneumonia |
| 2 | 9284 | P443 | 78 | M | Severe | Diabetes Mellitus & Hypertension | | B/l pneumonia |
| 3 | 9290 | P551 | 77 | M | Severe | No | 0.95 | B/l pneumonia |
| 4 | 8838 | P630 | 52 | F | Severe | Diabetes Mellitus & Hypertension | 0.96 | B/L pneumoia |
| 5 | 8852 | P631 | 70 | M | Severe | Diabetes Mellitus & Hypertension | 0.95 | B/L pneumoia |
| 6 | 9033 | P633 | 62 | M | Severe | Hypertension | 96% on 10lit O2 | B/L pneumoia |
| 7 | 9368 | P636 | 64 | F | Severe | Hypertension | 96% on 50% FiO2 | ARDS & B/LPneumonia |
| 8 | 9172 | P639 | 40 | M | Severe | None | 94% on 15lit O2 | ARDS & B/LPneumonia |
| 9 | 9988 | P682 | 40 | M | Severe | None | 90% on RA | B/LPneumonia |
| 10 | 9606 | P700 | 64 | M | Severe | Diabetes Mellitus & Hypertension | 94% on NRBM | B/LPneumonia |
| 11 | 9742 | P701 | 62 | M | Severe | Diabetes Mellitus | 98% on 11lit O2 | B/LPneumonia |
| 12 | 9878 | P702 | 46 | M | Severe | Diabetes Mellitus | 98% on 9lit O2 | B/LPneumonia |
| 13 | 10176 | P704 | 78 | M | Severe | Diabetes Mellitus & Hypertension | 96% on FiO2 50% | B/LPneumonia |
| 14 | 10235 | P710 | 80 | F | Severe | None | 90% on RA | ARDS & B/LPneumonia |
| 15 | 10235 | P711 | 80 | F | Severe | None | 70% on RA | ARDS & B/LPneumonia |
| 16 | 10244 | P712 | 47 | F | Severe | Hypertension & Hypothyroidism | 92% on RA | ARDS & B/LPneumonia |
| 17 | 10320 | P713 | 50 | M | Severe | None | 70% on RA | ARDS & B/LPneumonia |