

## DAFTAR PUSTAKA

- Agustiningsih. (2020). *Pedoman Pemeriksaan PCR SARS-CoV-2 bagi Petugas Laboratorium*. Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan (LPB).
- Al-Rifai, R. H., Acuna, J., Al Hossany, F. I., Aden, B., Al Memari, S. A., Al Mazrouei, S. K., & Ahmed, L. A. (2021). Epidemiological characterization of symptomatic and asymptomatic COVID-19 cases and positivity in subsequent RT-PCR tests in the United Arab Emirates. *PLoS ONE*, *16*(2 February), 1–23. <https://doi.org/10.1371/journal.pone.0246903>
- Alam, M. R., Kabir, M. R., & Reza, S. (2021). Comorbidities might be a risk factor for the incidence of COVID-19: Evidence from a web-based survey. *Preventive Medicine Reports*, *21*, 101319. <https://doi.org/10.1016/j.pmedr.2021.101319>
- Alanagreh, L., Alzoughool, F., & Atoum, M. (2020). The human coronavirus disease covid-19: Its origin, characteristics, and insights into potential drugs and its mechanisms. *Pathogens*, *9*(5). <https://doi.org/10.3390/pathogens9050331>
- Alsuliman, T., Sulaiman, R., Ismail, S., Srour, M., & Alrstom, A. (2020). *COVID-19 paraclinical diagnostic tools: Updates and future trends*. January. <http://dx.doi.org/10.1016/j.retram.2020.06.001>

- Amir, E., Fatemeh, J., Neda, P., & Ali, A. (2020). Prevalence of Underlying Diseases in Hospitalized Patients with COVID-19: a Systematic Review and Meta-Analysis. *Archives of Academic Emergency Medicine*, 8(1), e35–e35. <http://europepmc.org/article/MED/32232218><https://www.ncbi.nlm.nih.gov/pubmed/32232218>
- Anggraini, N. B., & Listyorini, D. (2021). S-D614G Mutation Reveals the Euro-America and East-Asia Origin SARS-CoV-2 Virus Spread in Indonesia. *Jurnal Riset Biologi Dan Aplikasinya*, 3(2), 45–53. <https://doi.org/10.26740/jrba.v3n2.p45-53>
- Annavajhala, M. K., Mohri, H., Wang, P., Nair, M., Zucker, J. E., Sheng, Z., Gomez-Simmonds, A., Kelley, A. L., Tagliavia, M., Huang, Y., Bedford, T., Ho, D. D., & Uhlemann, A. C. (2021). Emergence and expansion of SARS-CoV-2 B.1.526 after identification in New York. *Nature*, 597(7878), 703–708. <https://doi.org/10.1038/s41586-021-03908-2>
- Arya, R., Kumari, S., Pandey, B., & Hiral Mistry. (2021). Structural insights into SARS-CoV-2 proteins. *Journal of Molecular Biology*. <https://doi.org/https://doi.org/10.1016/j.jmb.2020.11.024>
- Augusto, G., Mohsen, M. O., Zinkhan, S., Liu, X., Vogel, M., & Bachmann, M. F. (2021). In vitro data suggest that Indian delta variant B.1.617 of SARS-CoV-2 escapes neutralization by both receptor affinity and immune evasion. *Allergy: European Journal of Allergy and Clinical*

*Immunology.*

Baek, M. S., Lee, M.-T., Kim, W.-Y., Choi, J. C., & Jung, S.-Y. (2021). COVID-19-related outcomes in immunocompromised patients: A nationwide study in Korea. *PLoS ONE*.

Barrett, E. S., Horton, D. B., Roy, J., Gennaro, M. L., Brooks, A., Tischfield, J., Greenberg, P., Andrews, T., Jagpal, S., Reilly, N., Carson, J. L., Blaser, M. J., & Panettieri, R. A. (2020). Prevalence of SARS-CoV-2 infection in previously undiagnosed health care workers in New Jersey, at the onset of the U.S. COVID-19 pandemic. *BMC Infectious Diseases*, 20(1). <https://doi.org/10.1186/s12879-020-05587-2>

Behjati, S., & Tarpey, P. S. (2013). What is next generation sequencing? *Archives of Disease in Childhood: Education and Practice Edition*, 98(6), 236–238. <https://doi.org/10.1136/archdischild-2013-304340>

Benton, D. J., Wrobel, A. G., Roustan, C., Borg, A., Xu, P., Martin, S. R., Rosenthal, P. B., Skehel, J. J., & Gamblin, S. J. (2021). The effect of the D614G substitution on the structure of the spike glycoprotein of SARS-CoV-2. *Proceedings of the National Academy of Sciences of the United States of America*, 118(9), 2–5. <https://doi.org/10.1073/pnas.2022586118>

Bergmann, C. C., & Silverman, R. H. (2020). COVID-19: Coronavirus replication, pathogenesis, and therapeutic strategies. *Cleveland Clinic Journal of Medicine*, 87(5), 321–327.

<https://doi.org/10.3949/CCJM.87A.20047>

Bhattacharya, M., Chatterjee, S., Sharma, A. R., Agoramoorthy, G., & Chakraborty, C. (2021). D614G mutation and SARS-CoV-2: impact on S-protein structure, function, infectivity, and immunity. *Applied Microbiology and Biotechnology*, *105*(24), 9035–9045. <https://doi.org/10.1007/s00253-021-11676-2>

Biosoft, P. (2021). *Real Time PCR, Reference*. [http://www.premierbiosoft.com/tech\\_notes/real\\_time\\_PCR.html](http://www.premierbiosoft.com/tech_notes/real_time_PCR.html)

Biswas, M., Rahaman, S., Biswas, T. K., Haque, Z., & Ibrahim, B. (2021). Association of Sex, Age, and Comorbidities with Mortality in COVID-19 Patients: A Systematic Review and Meta-Analysis. *Intervirology*, *64*(1), 36–47. <https://doi.org/10.1159/000512592>

Brufsky, A. (2020). Distinct Viral Clades of SARS-CoV-2: Implications for Modeling of Viral Spread. *Journal of Medical Virology*, 0–1. <https://doi.org/10.1002/jmv.25902>

Burki, T. (2021). Understanding variants of SARS-CoV-2. *Lancet (London, England)*, *397*(10273), 462. [https://doi.org/10.1016/S0140-6736\(21\)00298-1](https://doi.org/10.1016/S0140-6736(21)00298-1)

Cavasotto, C. N., & Lamas, M. S. (2020). Functional and druggability analysis of the SARS-CoV-2 proteome. *European Journal of Pharmacology*, *January*.

<https://doi.org/https://doi.org/10.1016/j.ejphar.2020.173705>

CBC News. (2020). *Community transmission of COVID-19 detected in Winnipeg, public health officials say.*

<https://www.cbc.ca/news/canada/manitoba/manitoba-covid-19-briefing-1.5517379>.

CDC. (2020). *Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) — United States, February 12–March 16, 2020.*

<https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e2.htm>

CDC. (2021a). *Frequently Asked Questions Covid-19.*

<https://www.cdc.gov/coronavirus/2019-ncov/faq.html>

CDC. (2021b). *SARS-CoV-2 Variant Classifications and Definitions.*

<https://www.cdc.gov/coronavirus/2019-ncov/variants/variant-info.html>

CDC. (2021c). *Science Brief: Omicron (B.1.1.529) Variant.*

<https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/scientific-brief-omicron-variant.html>

Chen, S., Zhang, Z., Yang, J., Wang, J., Zhai, X., Bärnighausen, T., & Wang, C. (2020). Fangcang shelter hospitals: a novel concept for responding to public health emergencies. *Lancet*.

Cherian, S., Potdar, V., Jadhav, S., Yadav, P., Gupta, N., Das, M., Rakshit, P., Singh, S., Abraham, P., & Panda, S. (2021). SARS-CoV-2 Spike Mutations, L452R, T478K, E484Q and P681R, in the Second Wave of

COVID-19 in Maharashtra, India. *Microorganisms*.

China CDC. (2020). *The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020*.

Chu, D. K., Akl, E. A., Duda, S., Solo, K., Yaacoub, S., Schünemann, H. J., El-harakeh, A., Bognanni, A., Lotfi, T., Loeb, M., Hajizadeh, A., Bak, A., Izcovich, A., Cuello-Garcia, C. A., Chen, C., Harris, D. J., Borowiack, E., Chamseddine, F., Schünemann, F., ... Reinap, M. (2020). Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. *The Lancet*, 395(10242), 1973–1987. [https://doi.org/10.1016/S0140-6736\(20\)31142-9](https://doi.org/10.1016/S0140-6736(20)31142-9)

Conti, P., & Younes, A. (2020). Coronavirus COV-19/SARS-CoV-2 affects women less than men: clinical response to viral infection. *Journal of Biological Regulators and Homeostatic Agents*. <https://doi.org/10.23812/Editorial-Conti-3>.

Corber, B. et al. (2020). Tracking Changes in SARS-CoV-2 Spike: Evidence that D614G Increases Infectivity of the COVID-19 Virus. *NCBI*. <https://doi.org/10.1016/j.cell.2020.06.043>: 10.1016/j.cell.2020.06.043

Corman, Victor, Landt, O., Kaiser, M., Molenkamp, R., Meijer, A., Chu, D. K., Bleicker, T., Brünink, S., Schneider, J., Luisa Schmidt, M., GJC Mulders, D., Haagmans, B. L., van der Veer, B., van den Brink, S., Wijsman, L., Goderski, G., Romette, J.-L., Ellis, J., Zambon, M., ...

Chantal, R. (2020). Detection of 2019-nCoV by RT-PCR. *Euro Surveill*, 25(3), 1–8.

Corman, Victor W., Bleicker, T., Brünink, S., Drosten, C., Landt, O., Koopmans, M., & Zambon, M. (2020). Diagnostic detection of Wuhan coronavirus 2019 by real-time RT-PCR. Corman V, Bleicker T, Brünink S, Drosten C, Zambon M, World Health Organization: Diagnostic detection of Wuhan coronavirus 2019 by real-time RT-PCR. *Geneva: World Health Organization*.

CoVariants. (2021). Variant: 21K (Omicron).  
<https://covariants.org/variants/21K.Omicron>

Cruz. (2020). Laboratory Testing Methods for Novel Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2). *Frontiers in Cell and Development Biology*. doi.org/10.3389/fcell.2020.00468

Cui, J. (2019). Origin and evolution of pathogenic coronaviruses. *Nature Reviews Microbiology*.

Docea, A. O. (2020). A new threat from an old enemy: Re-emergence of coronavirus (Review). *International Journal of Molecular Medicine*, 1631–1643. <https://doi.org/https://doi.org/10.3892/ijmm.2020.4555>

Doddapaneni, H., Cregeen, S. J., Sugang, R., Meng, Q., Qin, X., Avadhanula, V., Chao, H., Menon, V., Nicholson, E., Henke, D., Piedra, F. A., Rajan, A., Momin, Z., Kottapalli, K., Hoffman, K. L., Sedlazeck,

- F. J., Metcalf, G., Piedra, P. A., Muzny, D. M., ... Gibbs, R. A. (2021). Oligonucleotide capture sequencing of the SARS-CoV-2 genome and subgenomic fragments from COVID-19 individuals. *PLoS ONE*, *16*(8 August). <https://doi.org/10.1371/journal.pone.0244468>
- Domingo, E., Garc, C., & Lobo-vega, R. (2021). Proofreading-Repair Activities in RNA Virus Genetics. *Viruses*, *13*(1882), 1–15.
- Dong, X., Cao, Y. yuan, Yuan, Y. dong, Yang, Y. bin, Yan, Y. qin, Akdis, C. A., & Gao, Y. dong. (2020). Clinical characteristics of 140 patients infected with SARS-CoV-2 in Wuhan, China. *Allergy: European Journal of Allergy and Clinical Immunology*, *75*(7), 1730–1741. <https://doi.org/10.1111/all.14238>
- Doremalen, N. van. (2020). *Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1*. *The New England Journal of Medicine*. <https://doi.org/DOI: 10.1056/NEJMc2004973>
- Dorp, L. van, Tan, C. C., Lam, S. D., Richard, D., Owen, C., Berchtold, D., Orengo, C., & Balloux, F. (2020). Recurrent mutations in SARS-CoV-2 genomes isolated from mink point to rapid host-adaptation. *BioRxiv*, 2020.11.16.384743. <https://www.biorxiv.org/content/10.1101/2020.11.16.384743v1%0Ahttps://www.biorxiv.org/content/10.1101/2020.11.16.384743v1.abstract>
- Du, L., He, Y., Zhou, Y., Liu, S., Zheng, B. J., & Jiang, S. (2009). The spike protein of SARS-CoV - A target for vaccine and therapeutic



development. *Nature Reviews Microbiology*, 7(3), 226–236.  
<https://doi.org/10.1038/nrmicro2090>

Ejaz, H., Alsrhani, A., Zafar, A., Javed, H., Junaid, K., Abdalla, A. E., Abosalif, K. O. A., Ahmed, Z., & Younas, S. (2020). COVID-19 and comorbidities: Deleterious impact on infected patients. *Journal of Infection and Public Health*, 13(12), 1833–1839.  
<https://doi.org/10.1016/j.jiph.2020.07.014>

Ek, P., Bottiger, B., & Dahlman, D. (2019). A combination of naso- and oropharyngeal swabs improves the diagnostic yield of respiratory viruses in adult emergency department patients. *Infect Dis (Lond)*.  
[https://doi.org/DOI: 10.1080/23744235.2018.1546055](https://doi.org/DOI:10.1080/23744235.2018.1546055)

Fadl, N., Ali, E., & Salem, T. Z. (2021). COVID-19: Risk Factors Associated with Infectivity and Severity. *Scandinavian Journal of Immunology*, 93(6), 1–14. <https://doi.org/10.1111/sji.13039>

Falahi, S., & Kenarkoohi, A. (2020). Sex and gender differences in the outcome of patients with COVID-19. *Journal of Medical Virology*.  
[https://doi.org/DOI: 10.1002/jmv.26243](https://doi.org/DOI:10.1002/jmv.26243)

Fang, F. C., Naccache, S. N., & Greninger, A. L. (2020). The laboratory diagnosis of coronavirus disease 2019-frequently asked questions. *Clinical Infectious Diseases*, 71(11), 2996–3001.  
<https://doi.org/10.1093/cid/ciaa742>

Farkas, D. H., & Holland, C. A. (2009). Chapter 3 - Overview of Molecular Diagnostic Techniques and Instrumentation A2 - Tubbs, Raymond R. In *Cell and Tissue Based Molecular Pathology: A Volume in the Series Foundations in Diagnostic Pathology* (First Edit). Elsevier Inc. <https://doi.org/10.1016/B978-0-443-06901-7.50008-0>

Fernández-Rodríguez, A., Casas, I., Culebras, E., Morilla, E., Cohen, M. C., & Alberola, J. (2020). COVID-19 and post-mortem microbiological studies. *Spanish Journal of Legal Medicine*, *46*(3), 127–138. <https://doi.org/10.1016/j.remle.2020.05.007>

Freites Nuñez, D. D., Leon, L., Mucientes, A., Rodriguez-Rodriguez, L., Font Urgelles, J., Madrid García, A., Colomer, J. I., Jover, J. A., Fernandez-Gutierrez, B., & Abasolo, L. (2020). Risk factors for hospital admissions related to COVID-19 in patients with autoimmune inflammatory rheumatic diseases. *Annals of the Rheumatic Diseases*, *79*(11), 1393–1399. <https://doi.org/10.1136/annrheumdis-2020-217984>

Funk, T., Pharris, & Spiteri. (2021). Characteristics of SARS-CoV-2 variants of concern B.1.1.7, B.1.351 or P.1: data from seven EU/EEA countries, weeks 38/2020 to 10/2021. *Euro Suveill.* <https://doi.org/doi:10.2807/1560-7917.ES.2021.26.16.2100348>

Gaebler, C. (2021). Evolution of antibody immunity to SARS-CoV-2. *Nature*, *591*, 639–644. <https://doi.org/10.1101/2020.11.03.367391>

- Gago, S., Elena, S. F., Flores, R., & Sanjuán, R. (2009). Extremely high mutation rate of a hammerhead viroid. *Science*, 323(5919), 1308. <https://doi.org/10.1126/science.1169202>
- Garg, S., Kim, L., Whitaker, M., O'Halloran, A., Cummings, C., Holstein, R., Prill, M., Chai, S., Kirley, P., Alden, N., & Kawasaki, B. (2020). Hospitalization Rates and Characteristics of Patients Hospitalized with. *Morbidity and Mortality Weekly Report, US Department of Health and Human Services/Centers for Disease Control and Prevention*, 69(15), 458–464. <https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e3.htm>
- Gorbalenya, A. E., Baker, S. C., Baric, R. S., Groot, R. J. de, Drosten, C., Gulyaeva, A. A., Haagmans, B. L., Lauber, C., Leontovich, A. M., Gorbalenya, B. W. N. E., Baker, S. C., Baric, R. S., Groot, R. J. de, Drosten, C., Gulyaeva, A. A., & Bart L. Haagmans, Chris Lauber, Andrey M Leontovich, Benjamin W. Neuman, Dmitry Penzar, Stanley Perlman, Leo L.M. Poon, Dmitry Samborskiy, Igor A. Sidorov, Isabel Sola, John Ziebuhrman, Dmitry Penzar, Stanley Perlman, Leo L.M. Poon, Dmitry Samborskiy, Ig, J. Z. (2020). Severe acute respiratory syndrome-related coronavirus: The species and its viruses – a statement of the Coronavirus Study Group. *BioRxiv*.
- Gralinski, L. E., & Menachery, V. D. (2020). Return of the coronavirus: 2019-nCoV. *Viruses*, 12(2), 1–8. <https://doi.org/10.3390/v12020135>
- Greaney, A. J., Loes, A. N., & Crawford, K. H. D. (2021). Comprehensive

mapping of mutations in the SARSCoV- 2 receptor-binding domain that affect recognition by polyclonal human plasma antibodies. *Cell Host & Microbe*. <https://doi.org/https://doi.org/10.1016/j.chom.2021.02.003>

Groot, R. (2012). *Family Coronaviridae Virus taxonomy: ninth report of the International Committee on Taxonomy of Viruses*. (A. M. Q. King, M. J. Adams, E. B. Carstens, & E. J. Lefkowitz (eds.)). Academic Press.

Guan, W., Liang, W., Zhao, Y., Liang, H., Chen, Z., Li, Y., Liu, X., Chen, R., Tang, C., Wang, T., Ou, C., Li, L., Chen, P., Sang, L., Wang, W., Li, J., Li, C., Ou, L., Cheng, B., ... Zhong, N. (2020). Comorbidity and its impact on 1590 patients with COVID-19 in China: a nationwide analysis. *Eur Respir J*.

Guan, W., Ni, Z., Hu, Y., Liang, W., Ou, C., He, J., Liu, L., Shan, H., Lei, C., Hui, D. S. C., Du, B., Li, L., Zeng, G., Yuen, K.-Y., Chen, R., Tang, C., Wang, T., Chen, P., Xiang, J., ... Zhong, N. (2020). Clinical Characteristics of Coronavirus Disease 2019 in China. *New England Journal of Medicine*, 382(18), 1708–1720. <https://doi.org/10.1056/nejmoa2002032>

Gudbjartsson, D. F., Helgason, A., Jonsson, H., Magnusson, O. T., Melsted, P., Norddahl, G. L., Saemundsdottir, J., Sigurdsson, A., Sulem, P., Agustsdottir, A. B., Eiriksdottir, B., Fridriksdottir, R., Gardarsdottir, E. E., Georgsson, G., Gretarsdottir, O. S., Gudmundsson, K. R., Gunnarsdottir, T. R., Gylfason, A., Holm, H., ... Stefansson, K. (2020).

Spread of SARS-CoV-2 in the Icelandic Population. *New England Journal of Medicine*, 382(24), 2302–2315.  
<https://doi.org/10.1056/nejmoa2006100>

Guo, Yan-Rong, Qing-Dong Cao, Z.-S. H. (2020). The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak – an update on the status. *Military Medical Research*.  
<https://doi.org/https://doi.org/10.1186/s40779-020-00240-0>

Gupta, N., & Verma, V. K. (2019). *Next-Generation Sequencing and Its Application: Empowering in Public Health Beyond Reality*. 313–341.  
[https://doi.org/10.1007/978-981-13-8844-6\\_15](https://doi.org/10.1007/978-981-13-8844-6_15)

Health Ontario, P. (2021). COVID-19 B.1.1.7 (501Y.V1) Variant of Concern – What We Know So Far. *Ontario Agency for Health Protection and Promotion*, 7, 1–22. [www.publichealthontario.ca](http://www.publichealthontario.ca)

Hoang, V. T., Colson, P., & Levasseu, A. (2021). Clinical outcomes in patients infected with different SARS-CoV-2 variants at one 2 hospital during three periods of the COVID-19 epidemic in Marseille, France. *Clin. Microbiol. Infect.*

Hoffmann, M., Kleine-Weber, H., Schroeder, S., Krüger, N., Herrler, T., Erichsen, S., Schiergens, T. S., Herrler, G., Wu, N. H., Nitsche, A., Müller, M. A., Drosten, C., & Pöhlmann, S. (2020). SARS-CoV-2 Cell Entry Depends on ACE2 and TMPRSS2 and Is Blocked by a Clinically Proven Protease Inhibitor. *Cell*, 181(2), 271-280.e8.

<https://doi.org/10.1016/j.cell.2020.02.052>

Hou, Y. J., Chiba, S., Halfmann, P., Ehre, C., Kuroda, M., Dinnon, K. H., Leist, S. R., Schäfer, A., Nakajima, N., Takahashi, K., Lee, R. E., Mascenik, T. M., Graham, R., Edwards, C. E., Tse, L. V., Okuda, K., Markmann, A. J., Bartelt, L., Silva, A. De, ... Baric, R. S. (2020). SARS-CoV-2 D614G variant exhibits efficient replication ex vivo and transmission in vivo. *Science*, *370*(6523), 1464–1468. <https://doi.org/10.1126/science.abe8499>

Huang, S.-Y., Kung, Y.-A., Huang, P.-N., Chang, S.-Y., Gong, Y.-N., Han, Y.-J., Chiang, H.-J., Liu, K.-T., Lee, K.-M., Chang, C.-Y., Chang, C.-C., Huang, C.-G., & Shih, S.-R. (2021). Stability of SARS-CoV-2 Spike G614 Variant Surpasses That of the D614 Variant after Cold Storage. *MSphere*, *6*(2). <https://doi.org/10.1128/msphere.00104-21>

Huang, Y., Y, & Y. (2020). Viral Load in Clinical Samples from Critically Ill Patients. *Am J Respir Crit Care Med*.

Jaspe, R. C., Sulbarn, Y., Loureiro, C. L., D'angelo, P., Rodríguez, L., Garzaro, D. J., Rangel, H. R., & Pujol, F. H. (2021). Importance of mutations in amino acid 484 of the spike protein of sars-cov-2: Rapid detection by restriction enzyme analysis. *Investigacion Clinica (Venezuela)*, *62*, 18–26. <https://doi.org/10.22209/IC.v62s2a02>

Jin, Y., Yang, H., Ji, W., Wu, W., Chen, S., Zhang, W., & Duan, G. (2020). Virology, epidemiology, pathogenesis, and control of covid-19. *Viruses*,

12(4), 1–17. <https://doi.org/10.3390/v12040372>

Kemkes. (2020). *Pedoman Pencegahan dan Pengendalian Coronavirus Disease (Covid-19) Revisi ke 5*.

Kemkes. (2021). *Peta Sebaran Transmisi Lokal dan Wilayah Terkonfirmasi*. <https://infeksiemerging.kemkes.go.id/dashboard/covid-19>

Kementerian Kesehatan RI. (2021). *SITUASI TERKINI PERKEMBANGAN NOVEL CORONAVIRUS (COVID 19) Data dilaporkan sampai 28 Januari 2021*. [www.infeksiemerging.kemkes.go.id](http://www.infeksiemerging.kemkes.go.id)

Keputusan Menteri Kesehatan Republik Indonesia. (2020). Keputusan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/MenKes/413/2020 Tentang Pedoman Pencegahan dan Pengendalian Corona Virus Disease 2019 (Covid-19). *MenKes/413/2020, 2019, 207*.

Kling, J. (2005). The search for a sequencing thoroughbred. *Nature Biotechnology*, 23(11), 1333–1335. <https://doi.org/10.1038/nbt1105-1333>

Kompas.com. (2021a). *Mutasi Virus Corona B.1.1.7 Sudah Masuk Indonesia, Ini Informasi Lengkapnya*. <https://www.kompas.com/tren/read/2021/03/02/131116365/mutasi-virus-corona-b117-sudah-masuk-indonesia-ini-informasi->

lengkapnya?page=all.

Kompas.com. (2021b). *Mutasi Virus Corona E484K Diduga Pengaruhi Efikasi Vaksin Covid-19.*

<https://nasional.kompas.com/read/2021/04/05/15173271/mutasi-virus-corona-e484k-diduga-pengaruhi-efikasi-vaksin-covid-19>

Korber, B., Fischer, W. M., Gnanakaran, S., Yoon, H., Theiler, J., Abfalterer, W., Hengartner, N., Giorgi, E. E., Bhattacharya, T., Foley, B., Hastie, K. M., Parker, M. D., Partridge, D. G., Evans, C. M., Freeman, T. M., Silva, T. I. de, & Sheffield. (2020). Tracking Changes in SARS-CoV-2 Spike: Evidence that D614G Increases Infectivity of the COVID-19 Virus. *Cell*.

Korber, B., Will, & Sandrasegaram. (2020). Tracking Changes in SARS-CoV-2 Spike: Evidence that D614G Increases Infectivity of the COVID-19 Virus. *Cell*. <https://doi.org/DOI: 10.1016/j.cell.2020.06.043>

Koyama, T., Platt, D., & Parida, L. (2020). Variant analysis of SARS-CoV-2 genomes. *Bull World Health Organ*. <https://doi.org/doi:http://dx.doi.org/10.2471/BLT.20.253591>

Ku, C.-S., & Roukus, D. H. (2013). *From Next-Generation Sequencing to Nanopore Sequencing Technology:Paving The Way to personalized Genomic Medicine*. 10(1). <https://doi.org/doi.org/10.1586/erd.12.63>

Ku, Z., Xie, X., Davidson, E., Ye, X., Su, H., Menachery, V. D., Li, Y., Yuan,



Z., Zhang, X., Muruato, A. E., i Escuer, A. G., Tyrell, B., Doolan, K., Doranz, B. J., Wrapp, D., Bates, P. F., McLellan, J. S., Weiss, S. R., Zhang, N., ... An, Z. (2021). Molecular determinants and mechanism for antibody cocktail preventing SARS-CoV-2 escape. *Nature Communications*, 12(1). <https://doi.org/10.1038/s41467-020-20789-7>

La Scola, B., Le Bideau, M., Andreani, J., Hoang, V. T., Grimaldier, C., Colson, P., Gautret, P., & Raoult, D. (2020). Viral RNA load as determined by cell culture as a management tool for discharge of SARS-CoV-2 patients from infectious disease wards. *European Journal of Clinical Microbiology and Infectious Diseases*, 39(6), 1059–1061. <https://doi.org/10.1007/s10096-020-03913-9>

Lai, C. K. C., Chen, Z., & Lui, G. (2020). Prospective study comparing deep-throat saliva with other respiratory tract specimens in the diagnosis of novel coronavirus disease (COVID-19). *J Infect Dis*. <https://doi.org/doi:10.1093/infdis/jiaa487>

Lan, J., Ge, J., Yu, J., Shan, S., Zhou, H., Fan, S., Zhang, Q., Shi, X., Wang, Q., Zhang, L., & Wang, X. (2020). Structure of the SARS-CoV-2 spike receptor-binding domain bound to the ACE2 receptor. *Nature*, 581(7807), 215–220. <https://doi.org/10.1038/s41586-020-2180-5>

Lennerstrand, J., & Palanisamy, N. (2021). Global prevalence of adaptive and prolonged infections' mutations in the receptor-binding domain of the sars-cov-2 spike protein. *Viruses*, 13(10).

<https://doi.org/10.3390/v13101974>

Lesho, E., Corey, B., Lebreton, F., Ong, A. C., Swierczewski, B. E., Bennett, J. W., Walsh, E. E., & McGann, P. (2021). Emergence of the E484K Mutation in Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Lineage B.1.1.345 in Upstate New York. *Clinical Infectious Diseases*, 2(February), 1–4. <https://doi.org/10.1093/cid/ciab507>

Li, F. (2016). Structure, Function, and Evolution of Coronavirus Spike Proteins. *Annual Review of Virology*, 3, 237–261. <https://doi.org/10.1146/annurev-virology-110615-042301>

Li, Q., Wu, J., Nie, J., Zhang, L., Hao, H., Liu, S., Zhao, C., Zhang, Q., Liu, H., Nie, L., Qin, H., Wang, M., Lu, Q., Li, X., Sun, Q., Liu, J., Zhang, L., Li, X., Huang, W., & Wang, Y. (2020). The Impact of Mutations in SARS-CoV-2 Spike on Viral Infectivity and Antigenicity. *Cell*, 182(5), 1284-1294.e9. <https://doi.org/10.1016/j.cell.2020.07.012>

Liu, T., Liang, W., Zhong, H., He, J., Chen, Z., He, G., Song, T., Chen, S., Wang, P., Li, J., Lan, Y., Cheng, M., Huang, J., Niu, J., Xia, L., Xiao, J., Hu, J., Lin, L., Huang, Q., ... Ma, W. (2020). Risk factors associated with COVID-19 infection: a retrospective cohort study based on contacts tracing. *Emerging Microbes and Infections*, 9, 1546–1553. <https://doi.org/10.1080/22221751.2020.1787799>

Localnesw8. (2020). *Community transmission of COVID-19 identified in Teton County, more cases in Custer and Bonneville Counties*. 16

Januari 2022

Lu, R., Zhao, X., Li, J., Niu, P., Yang, B., Wu, H., Wang, W., Song, H., Huang, B., Zhu, N., Bi, Y., Ma, X., & Zhan, F. (2020). Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *The Lancet*, 2020(January), 19–21.

Manzanares-Meza, L. D., & Medina-Contreras, O. (2020). SARS-CoV-2 and influenza: A comparative overview and treatment implications. *Boletín Medico Del Hospital Infantil de Mexico*, 77(5), 262–273.  
<https://doi.org/10.24875/BMHIM.20000183>

NCBI. (2020). *Severe acute respiratory syndrome coronavirus 2 isolate Wuhan-Hu-1, complete genome*.  
<https://www.ncbi.nlm.nih.gov/nuccore/1798174254>

Nexstrain.org. (2021). *Clade Naming & Definitions*.  
[https://docs.nextstrain.org/projects/ncov/en/latest/reference/naming\\_clades.html](https://docs.nextstrain.org/projects/ncov/en/latest/reference/naming_clades.html)

Nextstrain. (2021). *Genomic epidemiology of novel coronavirus - Asia-focused subsampling*.  
[https://nextstrain.org/ncov/gisaid/asia?dmax=2021-04-24&f\\_region=Asia](https://nextstrain.org/ncov/gisaid/asia?dmax=2021-04-24&f_region=Asia)

Ng, W. H., Tipih, T., Makoah, N. A., Vermeulen, J. G., Goedhals, D., Sempa,

- J. B., Burt, F. J., Taylor, A., & Mahalingam, S. (2021). Comorbidities in SARS-CoV-2 patients: A systematic review and meta-analysis. *MBio*, 12(1), 1–12. <https://doi.org/10.1128/mBio.03647-20>
- Nguyen, H. T., Zhang, S., & Wang, Q. (2020). Spike glycoprotein and host cell determinants of SARS-CoV-2 entry and 2 cytopathic effects. *BioRxiv*. <https://doi.org/doi:https://doi.org/10.1101/2020.10.22.351569>;
- Nursofwa, R. F., Sukur, M. H., Kurniadi, B. K., & . H. (2020). Penanganan Pelayanan Kesehatan Di Masa Pandemi Covid-19 Dalam Perspektif Hukum Kesehatan. *Inicio Legis*, 1(1), 1–17. <https://doi.org/10.21107/il.v1i1.8822>
- Parwanto, M. (2020). Virus Corona (2019-nCoV) penyebab COVID-19. *Jurnal Biomedika Dan Kesehatan*, 3. <https://doi.org/DOI:http://dx.doi.org/10.18051/JBiomedKes.2020.v3.1-2>
- PATEL. R, Patel, R., Babady, E., Theel, E., Storch, G., Pinsky, B., George, K., Smith, T., & Bertuzzi, S. (2020). Report from the American Society for Microbiology COVID-19 COVID-19. *MBio*, 11(2), 1–5.
- PDPI, PAPDI, & PERDATIN. (2021). *Revisi Protokol Tatalaksana COVID-19*.
- Peiris, J. S. M., Guan, Y., & Yuen, K. Y. (2004). Severe acute respiratory syndrome. *Nature Medicine*, 10(12S), S88–S97.

<https://doi.org/10.1038/nm1143>

Pemkot. (2021). *Info Penanggulangan Covid-19 Makassar*.

<https://infocorona.makassar.go.id/>

Peretto, G., Sala, S., & Caforio, A. L. P. (2020). Acute myocardial injury, MINOCA, or myocarditis? Improving characterization of coronavirus-associated myocardial involvement. *European Heart Journal*, *41*(22), 2124–2125. <https://doi.org/10.1093/eurheartj/ehaa396>

Perrotta, F., Corbi, G., Mazzeo, G., Boccia, M., Aronne, L., D'Agnano, V., Komici, K., Mazzeo, G., Parrella, R., & Bianco, A. (2020). COVID-19 and the elderly: insights into pathogenesis and clinical decision-making. *Aging Clinical and Experimental Research*, *32*(8), 1599–1608. <https://doi.org/10.1007/s40520-020-01631-y>

Pierce, C. A., Sy, S., Galen, B., Goldstein, D. Y., Orner, E., Keller, M. J., Herold, K. C., & Herold, B. C. (2021). Natural mucosal barriers and COVID-19 in children. *JCI Insight*, *6*(9). <https://doi.org/10.1172/jci.insight.148694>

Planas, D., Bruel, T., Grzelak, L., Guivel-Benhassine, F., Staropoli, I., Porrot, F., Planchais, C., Buchrieser, J., Rajah, M. M., Bishop, E., Albert, M., Donati, F., Prot, M., Behillil, S., Enouf, V., Maquart, M., Smati-Lafarge, M., Varon, E., Schortgen, F., ... Schwartz, O. (2021). Sensitivity of infectious SARS-CoV-2 B.1.1.7 and B.1.351 variants to neutralizing antibodies. *Nature Medicine*, *27*(5), 917–924.

<https://doi.org/10.1038/s41591-021-01318-5>

Plante, J. A., Liu, Y., Liu, J., Xia, H., Johnson, B. A., Fontes-garfias, C. R., Mirchandani, D., Scharton, D., & Bilello, J. P. (2021). Spike mutation D614G alters SARS-CoV-2 fitness. *Nature*, 592(April).  
<https://doi.org/10.1038/s41586-020-2895-3>

Prastyowati, A. (2020). Mengenal Karakteristik Virus SARS-CoV-2 Penyebab Penyakit COVID-19 Sebagai Dasar Upaya Untuk Pengembangan Obat Antivirus Dan Vaksin. *BioTrends*, 11(1), 1–10.

Qiagen. (2021). *How important is the RNA purification process, for obtaining reliable qRT-PCR results?* Qiagen.  
<https://www.qiagen.com/us/resources/faq?id=77fec858-9a8a-4d6a-9577-c604de14e858&lang=en>

Rambaut, A., Loman, N., Pybus, O., Barclay, W., Barrett, J., Carabelli, A., Connor, T., Peacock, T., Robertson, D. L., & Volz, E. (2020). *Preliminary genomic characterisation of an emergent SARS-CoV-2 lineage in the UK defined by a novel set of spike mutations.*  
<https://virological.org/t/preliminary-genomic-characterisation-of-an-emergent-sars-cov-2-lineage-in-the-uk-defined-by-a-novel-set-of-spike-mutations/563>

Raza, H. A., Sen, P., Bhatti, O. A., & Gupta, L. (2021). Sex hormones, autoimmunity and gender disparity in COVID-19. In *Rheumatology International* (Vol. 41, Issue 8, pp. 1375–1386).

<https://doi.org/10.1007/s00296-021-04873-9>

Reusken, C. B., Buiting, A., Bleeker-rovers, C., Diederens, B., Hooiveld, M., Friesema, I., Kortbeek, T., Lutgens, S. P. M., Meijer, A., Overdeest, I., & Trienekens, T. (2020). *Rapid assessment of regional SARS-CoV-2 community transmission through a convenience sample of healthcare workers , the Netherlands , March 2020. March, 6–9.*

Robson, F., Khan, K. S., Le, T. K., Paris, C., Demirbag, S., Barfuss, P., Rocchi, P., & Ng, W. L. (2020). Coronavirus RNA Proofreading: Molecular Basis and Therapeutic Targeting. *Molecular Cell, 79(5)*, 710–727. <https://doi.org/10.1016/j.molcel.2020.07.027>

Sahajpal, N. S. (2021). *COVID-19 RT-PCR diagnostic assay sensitivity and SARS-CoV-2 transmission: A missing link?* <https://doi.org/10.1101/2021.03.24.21254271>

Sahin, A. R. (2020). 2019 Novel Coronavirus (COVID-19) Outbreak: A Review of the Current Literature. *Eurasian Journal of Medicine and Oncology, 4(1)*, 1–7. <https://doi.org/10.14744/ejmo.2020.12220>

Sánchez-oro, R., Nuez, J. T., & Martínez-sanz, G. (2020). *Radiological findings for diagnosis of SARS-CoV-2 pneumonia (COVID-19). January.*

Sanjuán, R., & Domingo-Calap, P. (2016). Mechanisms of viral mutation. *Cellular and Molecular Life Sciences, 73(23)*, 4433–4448.

<https://doi.org/10.1007/s00018-016-2299-6>

Satgas Covid. (2021, June 1). *Melakukan Solusi Paralel dan Kolektif Dapat Mengantisipasi Varian Mempengaruhi Efikasi Vaksin.*

<https://covid19.go.id/berita/melakukan-solusi-paralel-dan-kolektif-dapat-mengantisipasi-varian-mempengaruhi-efikasi-vaksin>

Shendure, J. (2008). Next-Generation DNA Sequencing. *Nature Biotechnology*. <https://doi.org/https://doi.org/10.1038/nbt1486>

Shereen, M. A., Khan, S., Kazmi, A., Bashir, N., & Siddique, R. (2020). COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research*, 24, 91–98. <https://doi.org/10.1016/j.jare.2020.03.005>

Stall, N. M., Wu, W., Lapointe-Shaw, L., Fisman, D. N., Giannakeas, V., Hillmer, M. P., & Rochon, P. A. (2020). Sex- and Age-Specific Differences in COVID-19 Testing, Cases, and Outcomes: A Population-Wide Study in Ontario, Canada. *Journal of the American Geriatrics Society*, 68(10), 2188–2191. <https://doi.org/10.1111/jgs.16761>

Stokes, E. K., Zambrano, L. D., & Kayla. (2020). Coronavirus Disease 2019 Case Surveillance — United States, January 22–May 30, 2020. *MMWR Morb Mortal Wkly Rep*. <https://doi.org/doi:10.15585/mmwr.mm6924e2>

Su, S. (2016). Epidemiology, Genetic Recombination, and Pathogenesis of Coronaviruses. *Trends Microbiol.* <https://doi.org/doi:>



10.1016/j.tim.2016.03.003.

Summer E. Galloway. (2021). *Emergence of SARS-CoV-2 B.1.1.7 Lineage — United States, December 29, 2020–January 12, 2021*. CDC. <https://www.cdc.gov/mmwr/volumes/70/wr/mm7003e2.htm>

Sun, J., He, W., Wang, L., Lai, A., Ji, X., Zhai, X., Li, G., Suchard, M. A., Tian, J., Zhou, J., Veit, M., & Su, S. (2020). *COVID-19 : Epidemiology , Evolution , and Cross-Disciplinary Perspectives*. January.

Surendra, H., Elyazar, I. R., Djaafara, B. A., Ekawati, L. L., Saraswati, K., Adrian, V., Widyastuti, Oktavia, D., Salama, N., Lina, R. N., Andrianto, A., Lestari, K. D., Burhan, E., Shankar, A. H., Thwaites, G., Baird, J. K., & Hamers, R. L. (2021). Clinical characteristics and mortality associated with COVID-19 in Jakarta, Indonesia: A hospital-based retrospective cohort study. *The Lancet Regional Health - Western Pacific*, 9, 100108. <https://doi.org/10.1016/j.lanwpc.2021.100108>

Tassone, D., Thompson, A., Connell, W., Lee, T., Ungaro, R., An, P., Ding, Y., & Ding, N. S. (2021). Immunosuppression as a risk factor for COVID-19: a meta-analysis. *Internal Medicine Journal*, 51(2), 199–205. <https://doi.org/10.1111/imj.15142>

Tegally, H., Wilkinson, E., Giovanetti, M., Iranzadeh, A., Fonseca, V., Giandhari, J., Doolabh, D., Pillay, S., San, E. J., Msomi, N., Mlisana, K., von Gottberg, A., Walaza, S., Allam, M., Ismail, A., Mohale, T., Glass, A. J., Engelbrecht, S., van Zyl, G., ... de Oliveira, T. (2020).

Emergence and rapid spread of a new severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2) lineage with multiple spike mutations in South Africa. *MedRxiv*, 2. <https://doi.org/10.1101/2020.12.21.20248640>

Tian, F., Tong, B., Sun, L., Shi, S., Zheng, B., Wang, Z., Dong, X., & Zheng, P. (2021). N501y mutation of spike protein in sars-cov-2 strengthens its binding to receptor ace2. *ELife*, 10, 1–17. <https://doi.org/10.7554/eLife.69091>

Tian, S., Hu, N., Lou, J., Chen, K., Kang, X., Xiang, Z., Chen, H., Wang, D., Liu, N., Liu, D., Cheng, G., Zhang, Y., Li, D., Li, J., Lian, H., Niu, S., & Zhang, L. (2020). Characteristics of COVID-19 infection in Beijing. *Journal of Infection*.

Turista, D. D. R., Islamy, A., Kharisma, V. D., & Ansori, A. N. M. (2020). Distribution of COVID-19 and phylogenetic tree construction of sars-CoV-2 in Indonesia. *Journal of Pure and Applied Microbiology*, 14(May), 1035–1042. <https://doi.org/10.22207/JPAM.14.SPL1.42>

Vega-Magaña, N., Sánchez-Sánchez, R., Hernández-Bello, J., Venancio-Landeros, A. A., Peña-Rodríguez, M., Vega-Zepeda, R. A., Galindo-Ornelas, B., Díaz-Sánchez, M., García-Chagollán, M., Macedo-Ojeda, G., García-González, O. P., & Muñoz-Valle, J. F. (2021). RT-qPCR Assays for Rapid Detection of the N501Y, 69-70del, K417N, and E484K SARS-CoV-2 Mutations: A Screening Strategy to Identify Variants With

Clinical Impact. *Frontiers in Cellular and Infection Microbiology*, 11(May), 1–11. <https://doi.org/10.3389/fcimb.2021.672562>

Viner, R. M., Mytton, O. T., Bonell, C., Melendez-Torres, G. J., Ward, J., Hudson, L., Waddington, C., Thomas, J., Russell, S., Klis, F. van der, & Koiral, A. (2021). Susceptibility to SARS-CoV-2 Infection Among Children and Adolescents Compared With Adults. *Jama Pediatr.* <https://doi.org/https://dx.doi.org/10.1001%2Fjamapediatrics.2020.4573>

3

Wang, W., Xu, Y., & Gao, R. (2020). Detection of SARS-CoV-2 in Different Types of Clinical Specimens. *JAMA - Journal of the American Medical Association.* <https://doi.org/10.1001/jama.2020.3786>

Wang, Zhou, Qiang, W., & Ke, H. (2020). A Handbook of 2019-nCoV Pneumonia Control and Prevention. *Hubei Science and Technology Press*, 1–108.

Wang, Zijun, Schmidt, F., Weisblum, Y., Muecksch, F., Barnes, C. O., Finkin, S., Schaefer-Babajew, D., Cipolla, M., Gaebler, C., Lieberman, J. A., Oliveira, T. Y., Yang, Z., Abernathy, M. E., Huey-Tubman, K. E., Hurley, A., Turroja, M., West, K. A., Gordon, K., Millard, K. G., ... Nussenzweig, M. C. (2021). mRNA vaccine-elicited antibodies to SARS-CoV-2 and circulating variants. *Nature*, 592(7855), 616–622. <https://doi.org/10.1038/s41586-021-03324-6>

Weissman, D., Alameh, M.-G., Thushan de Silva, ..., B. F. H., & Bette

Korber, D. C. M. (2021). D614G Spike Mutation Increases SARS CoV-2 Susceptibility to Neutralization. *Cell Host & Microbe*.

WHO-China Joint Mission. (2020). Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). *The WHO-China Joint Mission on Coronavirus Disease 2019, 2019*(February), 16–24. <https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf>

WHO. (2020a). Clinical management of COVID-19 (Interim Guidance). *World Health Organization*. <https://apps.who.int/iris/handle/10665/332196>

WHO. (2020b). *Coronavirus Disease (Covid-19)-events as they happen*.

WHO. (2020c). Diagnostic testing for SARS-CoV-2. *Interim Guidance*.

WHO. (2020d). *Media Statement on Confirmed Covid-19 Cases*.

WHO. (2020e). *Tes Diagnostik Untuk SARS-CoV-2 : Panduan Interim*.

WHO. (2020f). *Tracking SARS-CoV-2 variants*. <https://www.who.int/en/activities/tracking-SARS-CoV-2-variants/>

WHO. (2020g). *Transmission of SARS-CoV-2: implications for infection prevention precautions*. <https://www.who.int/news-room/commentaries/detail/transmission-of-sars-cov-2-implications-for-infection-prevention-precautions>

- WHO. (2021a). *Coronavirus disease (COVID-19) Pandemic — Emergency Use Listing Procedure (EUL) open for IVDs*.  
<https://extranet.who.int/pqweb/vitro-diagnostics/coronavirus-disease-covid-19-pandemic---emergency-use-listing-procedure-eul-open>
- WHO. (2021b). *Genomic sequencing of SARS-CoV-2* (Issue January).  
<https://www.who.int/publications/i/item/9789240018440>
- WHO. (2021c). *The Effects of Virus Variants on Covid 19 Vaccines*.  
[https://www.who.int/news-room/feature-stories/detail/the-effects-of-virus-variants-on-covid-19-vaccines?gclid=CjwKCAiA1uKMBhAGEiwAxzvX991C49pkpeiBaVDPrgf7loGtJqKEwrJvRHfskgdC0tLTBsNOczPbGhoCKN4QAvD\\_BwE](https://www.who.int/news-room/feature-stories/detail/the-effects-of-virus-variants-on-covid-19-vaccines?gclid=CjwKCAiA1uKMBhAGEiwAxzvX991C49pkpeiBaVDPrgf7loGtJqKEwrJvRHfskgdC0tLTBsNOczPbGhoCKN4QAvD_BwE)
- WHO. (2021d). *WHO Coronavirus (Covid-19) Dashboard*.  
<https://covid19.who.int/>
- Winichakoon, P., Y., & Y. (2020). Negative Nasopharyngeal and Oropharyngeal Swabs Do Not Rule Out COVID-19. *J Clin Microbiol*.
- Wise, J. (2021). Covid-19: The E484K mutation and the risks it poses. *BMJ (Clinical Research Ed.)*, 372(February), n359.  
<https://doi.org/10.1136/bmj.n359>
- Wit, E. de. (2016). SARS and MERS: recent insights into emerging coronaviruses. *Nature Reviews Microbiology*. <https://doi.org/doi:10.1038/nrmicro.2016.81>.

- Wong, M. L., & Medrano, J. F. (2005). *One-Step Versus Two-Step Real-Time PCR*. *39*(1), 75–85. <https://doi.org/10.2144/05391RV01>
- Wozniak, A., Cerda, A., Ibarra-Henríquez, C., Sebastian, V., Armijo, G., Lamig, L., Miranda, C., Lagos, M., Solari, S., Guzmán, A. M., Quiroga, T., Hitschfeld, S., Riveras, E., Ferrés, M., Gutiérrez, R. A., & García, P. (2020). A simple RNA preparation method for SARS-CoV-2 detection by RT-qPCR. *Scientific Reports*, *10*(1), 1–8. <https://doi.org/10.1038/s41598-020-73616-w>
- Wu, F., Zhao, S., Yu, B., Chen, Y. M., Wang, W., Song, Z. G., Hu, Y., Tao, Z. W., Tian, J. H., Pei, Y. Y., Yuan, M. L., Zhang, Y. L., Dai, F. H., Liu, Y., Wang, Q. M., Zheng, J. J., Xu, L., Holmes, E. C., & Zhang, Y. Z. (2020). A new coronavirus associated with human respiratory disease in China. *Nature*, *579*(7798), 265–269. <https://doi.org/10.1038/s41586-020-2008-3>
- Wu, J. R., Sun, B., Wu, X. D., Shang, B., Yang, R. F., Yu, H., Ma, Z. H., Shen, X., Ji, Y. Y., Lin, Y., Wu, Y. Di, Lin, G. M., Tian, L., Gan, X. Q., Yang, S., Jiang, W. H., Dai, E. H., Wang, X. Y., Jiang, H. L., ... Li, L. (2004). ARTICLE The spike protein of severe acute respiratory syndrome (SARS) is cleaved in virus infected Vero-E6 cells. *Cell Research*, *14*(5), 400–406. <http://www.cell-research.com><http://www.cell-research.com>
- Wu, Z., & McGoogan, J. M. (2020). Characteristics of and Important

Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. *JAMA - Journal of the American Medical Association*. <https://doi.org/DOI: 10.1001/jama.2020.2648>

Xia, X. (2021). Domains and functions of spike protein in sars-cov-2 in the context of vaccine design. *Viruses*, 13(1), 1–16. <https://doi.org/10.3390/v13010109>

Xie, Y., Wang, Z., Liao, H., Marley, G., Wu, D., & Tang, W. (2020). Epidemiologic, clinical, and laboratory findings of the COVID-19 in the current pandemic: Systematic review and meta-analysis. *BMC Infectious Diseases*, 20(1), 1–12. <https://doi.org/10.1186/s12879-020-05371-2>

Xu, X. W., Wu, X. X., Jiang, X. G., Xu, K. J., Ying, L. J., Ma, C. L., Li, S. B., & Wang, H. Y. (2020). Clinical findings in a group of patients infected with the 2019 novel coronavirus (SARS-Cov-2) outside of Wuhan, China: retrospective case series. *BMJ*.

Yang, T.-J., Yu, P.-Y., Chang, Y.-C., Liang, K.-H., Tso, H.-C., Ho, M.-R., Chen, W.-Y., Lin, H.-T., Wu, H.-C., & Hsu, S.-T. D. (2021). Impacts on the structure-function relationship of SARS-CoV-2 spike by B.1.1.7 mutations. *BioRxiv*, 2021.05.11.443686. <http://biorxiv.org/content/early/2021/05/12/2021.05.11.443686.abstract>

- You, J., Seok, J. H., Joo, M., Bae, J. Y., Kim, J. II, Park, M. S., & Kim, K. (2021). Multifactorial traits of sars-cov-2 cell entry related to diverse host proteases and proteins. *Biomolecules and Therapeutics*, 29(3), 249–262. <https://doi.org/10.4062/biomolther.2021.048>
- Young, B. E., Ong, S. W. X., Kalimuddin, S., Low, J. G., Tan, S. Y., Loh, J., Ng, O. T., Marimuthu, K., Ang, L. W., Mak, T. M., Lau, S. K., Anderson, D. E., Chan, K. S., Tan, T. Y., Ng, T. Y., Cui, L., Said, Z., Kurupatham, L., Chen, M. I. C., ... Lye, D. C. (2020). Epidemiologic Features and Clinical Course of Patients Infected with SARS-CoV-2 in Singapore. *JAMA - Journal of the American Medical Association*, 323(15), 1488–1494. <https://doi.org/10.1001/jama.2020.3204>
- Yurkovetskiy, L., Wang, X., Pascal, K. E., Tomkins-Tinch, C., Nyalile, T., Wang, Y., Baum, A., Diehl, W. E., Dauphin, A., Carbone, C., Veinotte, K., Egri, S., Schaffner, S., Lemieux, J. E., Munro, J., Rafique, A., Barve, A., Sabeti, P. C., Kyratsous, C. A., ... Luban, J. (2020). Structural and Functional Analysis of the D614G SARS-CoV-2 Spike Protein Variant. *SSRN Electronic Journal*, January. <https://doi.org/10.2139/ssrn.3657338>
- Yuwono, T. (2006). *Teori dan Aplikasi Polymerase Chain Reaction* (D. Hardjono (ed.)). Penerbit Andi Yogyakarta.
- Zhang, L., Jackson, C. B., Mou, H., Ojha, A., Rangarajan, E. S., Izard, T., Farzan, M., & Choe, H. (2020a). The D614G mutation in the SARS-



CoV-2 spike protein reduces S1 shedding and increases infectivity.

*BioRxiv*. <https://doi.org/10.1101/2020.06.12.148726>

Zhang, L., Jackson, C. B., Mou, H., Ojha, A., Rangarajan, E. S., Izard, T.,

Farzan, M., & Choe, H. (2020b). The D614G mutation in the SARS-

CoV-2 spike protein reduces S1 shedding and increases infectivity.

*BioRxiv*, 90033(4). <https://doi.org/10.1101/2020.06.12.148726>

Zheng, L., Wang, X., Zhou, C., Liu, Q., Li, S., Sun, Q., Wang, M., Zhou, Q.,

& Wang, W. (2020). Analysis of the Infection Status of Healthcare

Workers in Wuhan during the COVID-19 Outbreak: A Cross-sectional

Study. *Clinical Infectious Diseases*, 71(16), 2109–2113.

<https://doi.org/10.1093/cid/ciaa588>

Zhou, F. (2020). Clinical Course And Risk Factors For Mortality Of Adult In

Patients With COVID-19 In Wuhan, China: A Retrospective Cohort

Study. *Journal of Medicine Study & Research*, 3(1), 01–02.

<https://doi.org/10.24966/msr-5657/100015>

Zhou, L., Niu, Z., Jiang, X., Zhang, Z., Zheng, Y., Wang, Z., Zhu, Y., Gao,

L., Huang, H., Wang, X., & Sun, Q. (2020). SARS-CoV-2 Targets by

the pscRNA Profiling of ACE2, TMPRSS2 and Furin Proteases.

*IScience*, 23(11), 101744. <https://doi.org/10.1016/j.isci.2020.101744>

## Lampiran 1

HASIL *NEXT GENERATION SEQUENCING* (File Fasta yang dikonversi dari FastQ)

seqName	clade	qc.overallScore	qc.overallStatus	totalSubstitutions	totalDeletions	totalInsertions	totalFrameShifts	totalAminoacidSubstitutions	totalAminoacidDeletions	totalMissing	totalNonACGTNs	totalPcrPrimerChanges	substitutions	deletions	insertions	frameShifts	aaSubstitutions	aaDeletions	missing	nonACGTNs	pcrPrimerChanges	alignmentScore	alignmentStart	alignmentEnd	qc.missingData.missingDataThreshold	qc.missingData.score	qc.missingData.status	qc.missingData.totalMissing	qc.mixedSites.mixedSitesThreshold	qc.mixedSites.score	qc.mixedSites.status	qc.mixedSites.totalMixedSites	qc.privateMutations.cutoff	qc.privateMutations.excess	qc.privateMutations.score	qc.privateMutations.status	qc.privateMutations.total	qc.snpClusters.clusteredSNPs	qc.snpClusters.score	qc.snpClusters.status	qc.snpClusters.totalSNPs	qc.frameShifts.frameShifts	qc.frameShifts.totalFrameShifts	qc.frameShifts.frameShiftsIgnored	qc.frameShifts.totalFrameShiftsIgnored	qc.frameShifts.score	qc.frameShifts.status	qc.stopCodons.stopCodons	qc.stopCodons.totalStopCodons	qc.stopCodons.score	qc.stopCodons.status	errors
P1 barcode06	20A	0.000000	good	22	0	0	0	13	0	121	0	1	C241T,C683T,C3037T,C3096T,C3768T,C5184T,C5628T,C11195T,C12880T,C14408	T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,G25595A,C26735T,C28887T,C29718T,C29743T	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:T1788M,ORF1a:L364	4F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:R68K,S:N439K,S:D614G,S:P681R	1-54,29837-29903	ChinaCDC_N_F:C28887T	89621	0	29903	3000.000000	0.000000	good	121	10.000000	0.000000	good	0	24.000000	-6.000000	0.000000	good	2.000000	0.000000	good	0	0	0	0.000000	good	0	0.000000	good	0	0.000000	good	0	0.000000	good		
P2 barcode07	20A	0.000000	good	18	0	0	0	8	0	121	0	1																																								

C203T,C241T,C2488T,C3037T,C3768T,C5183T,C5184T,A10912G,C14408T,A1455  
0G,C18877T,C20389T,C22879A,A23403G,C25521T,G25563T,C26735T,C28887T

N:T205I,ORF1a:T1168I,ORF1a:P1640F,ORF1b:P314L,ORF1b:R2308C,ORF3a:Q57H  
,S:N439K,S:D614G 1-54,29837-29903 ChinaCDC\_N\_F:C28887T  
89637 0 29903 3000.000000 0.000000 good 121  
10.000000 0.000000 good 0 24.000000 -1.000000  
0.000000 good 7.000000 0.000000 good 0  
0 0 0.000000 good 0 0.000000  
good

P3 barcode08 20A 0.694444 good 21 0 0 0 11  
0 121 0 1

C241T,T670C,C3037T,A3303G,C3768T,C5184T,G7229T,C7764T,C12025T,C14408  
T,G18027T,C18877T,C19524T,C20436T,C22879A,A23403G,G25563T,C26060T,C26735T,C  
28887T,G29648T

N:T205I,ORF1a:E1013G,ORF1a:T1168I,ORF1a:P1640L,ORF1a:G2322C,ORF1a:S25  
00F,ORF1b:P314L,ORF3a:Q57H,ORF3a:T223I,S:N439K,S:D614G 1-54,29837-  
29903 ChinaCDC\_N\_F:C28887T 89625 0 29903 3000.000000  
0.000000 good 121 10.000000 0.000000 good 0  
24.000000 2.000000 8.333333 good 10.000000  
0.000000 good 0 0 0 0.000000  
good 0 0.000000 good

P4 barcode09 20A 0.000000 good 22 0 0 0 13  
0 121 0 1

C241T,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C14408T,C1701  
2T,C18877T,T22219C,C22879A,A23403G,C23604G,T25496C,G25563T,C26735T,C28887T,  
C29025T,C29718T,C29743T

N:T205I,N:A251V,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF  
1b:P314L,ORF1b:S1182L,ORF3a:I35T,ORF3a:Q57H,S:N439K,S:D614G,S:P681R  
1-54,29837-29903 ChinaCDC\_N\_F:C28887T 89621 0  
29903 3000.000000 0.000000 good 121 10.000000  
0.000000 good 0 24.000000 -6.000000 0.000000  
good 2.000000 0.000000 good 0 0  
0 0.000000 good 0 0.000000 good

P5 barcode10 20A 0.000000 good 19 0 0 0 11  
0 121 0 1

C241T,T670C,C3037T,C3768T,A4937G,C5184T,A5217C,C14408T,G18027T,C1887  
7T,C19524T,C20436T,G20668T,C22879A,A23403G,G25563T,C26060T,C26735T,C28887T

N:T205I,ORF1a:T1168I,ORF1a:T1558A,ORF1a:P1640L,ORF1a:N1651T,ORF1b:P314L,ORF1b:A2401S,ORF3a:Q57H,ORF3a:T223I,S:N439K,S:D614G 1-54,29837-29903  
 ChinaCDC\_N\_F:C28887T 89633 0 29903 3000.000000  
 0.000000 good 121 10.000000 0.000000 good 0  
 24.000000 0.000000 0.000000 good 8.000000  
 0.000000 good 0 0 0 0.000000  
 good 0 0.000000 good

P6 barcode11 20A 0.000000 good 22 0 0 0 12  
 0 121 0 1

C241T,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,G11417T,C12880T,C14408T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,C23707T,G25563T,C26735T,C28887T,C29718T,C29743T

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:V3718F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R 1-54,29837-29903  
 ChinaCDC\_N\_F:C28887T 89621 0 29903  
 3000.000000 0.000000 good 121 10.000000 0.000000  
 good 0 24.000000 -6.000000 0.000000 good  
 2.000000 0.000000 good 0 0  
 0 0.000000 good 0 0.000000 good

P7 barcode12 20A 0.000000 good 25 12 0 0 16  
 4 121 0 1

C241T,C683T,C3037T,C3096T,C3768T,C5184T,T5840C,A6360G,C6402T,C11195T,C12880T,C14408T,C17012T,C18877T,G21989T,T22219C,C22879A,A23403G,C23604G,G25455T,G25563T,C26735T,C28887T,C29718T,C29743T 27682-27693

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:Y1859H,ORF1a:D2032G,ORF1a:P2046L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:K21N,ORF3a:Q57H,S:V143F,S:N439K,S:D614G,S:P681R ORF7a:Y97-,ORF7a:S98-,ORF7a:P99-,ORF7a:I100- 1-54,29837-29903  
 ChinaCDC\_N\_F:C28887T 89566  
 0 29903 3000.000000 0.000000 good 121 10.000000  
 0.000000 good 0 24.000000 -3.000000 0.000000  
 good 5.000000 0.000000 good 0 0  
 0 0.000000 good 0 0.000000 good

P8 barcode13 20A 0.000000 good 27 3 0 0 13  
 1 121 0 2

C241T,C683T,C3037T,C3096T,C3768T,T4813C,C5184T,C5314T,C11195T,G11245A,C12374T,C12880T,C14184T,C14408T,C17012T,C18877T,T20229C,T22219C,G22604T,C22879A,A23403G,C23604G,G25563T,C26735T,C28887T,C29718T,C29743T 21992-21994

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:L4037

F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,S:A348S,S:N439K,S:D614G,S:P681R S:Y144-1-54,29837-29903

ChinaCDC_N_F:C28887T,Pasteur_IP4_R:C14184T	89585	0	29903
3000.000000	0.000000	good	121
10.000000	0.000000		
good	0	24.000000	-1.000000
0.000000	good	0	0
7.000000	0.000000	good	0
0	0.000000	good	0
0.000000	good	0	0.000000
good			good

P9 barcode14 20A 0.000000 good 21 0 0 0 11  
0 121 0 1

C241T,C683T,C3037T,C3096T,C3768T,C5184T,A9949G,C11195T,C12880T,C14408T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,C26735T,C28887T,C29718T,C29743T

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R 1-54,29837-29903

ChinaCDC_N_F:C28887T	89625	0	29903	3000.000000
0.000000	good	121	10.000000	0.000000
good	0			good
24.000000	-7.000000	0.000000	good	1.000000
0.000000	good	0	0	0
0.000000	good	0	0	0.000000
good	0	0.000000	good	

P10 barcode15 20A 0.000000 good 25 0 0 0 13  
0 121 0 1

C241T,A544G,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C13536T,C14408T,C16580T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,C26735T,C28647T,C28887T,C29718T,G29736T,C29743T

N:A125V,N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:T1038I,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R

1-54,29837-29903	ChinaCDC_N_F:C28887T	89609	0
29903	3000.000000	0.000000	good
121	10.000000		
0.000000	good	0	24.000000
-3.000000	0.000000	good	0
0.000000	good	5.000000	0
0	0.000000	good	0
0	0.000000	good	0
0.000000	good	0	0.000000
good			good

P11 barcode16 20A 0.000000 good 25 0 0 0 13  
0 121 0 1

C241T,A544G,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C13536T,C14408T,C16580T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,C26735T,C28647T,C28887T,C29718T,G29736T,C29743T

N:A125V,N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:T1038I,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R

1-54,29837-29903	ChinaCDC_N_F:C28887T	89609	0
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29903	3000.000000	0.000000	good	121	10.000000			
0.000000	good	0	24.000000	-3.000000	0.000000			
good	5.000000		0.000000	good	0		0	
0	0.000000	good	0	0.000000	good			

P12 barcode17 20A 0.000000 good 23 0 0 0 12  
0 121 0 1  
C241T,C683T,C3037T,C3096T,C3768T,G3824A,C5184T,C5239T,C11195T,C12880  
T,C14408T,C17012T,C18877T,C21516T,T22219C,C22879A,A23403G,C23604G,G25563T,C  
26735T,C28887T,C29718T,C29743T  
N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:V1187I,ORF1a:P1640L,ORF1a:L3644  
F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R 1-  
54,29837-29903 ChinaCDC\_N\_F:C28887T 89617 0 29903

3000.000000	0.000000	good	121	10.000000	0.000000			
good	0	24.000000	-5.000000	0.000000	good			
3.000000		0.000000	good	0	0			
0	0.000000	good	0	0.000000	good			

P13 barcode20 20A 112.500000 bad 24 2 0 1 13  
1 121 0 1  
C241T,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C14408T,C1701  
2T,C18877T,T22219C,C22450T,C22879A,A23403G,C23604G,G25563T,G26172T,C26735T  
,C27367T,C27389T,C28887T,C29718T,C29743T 27796-27797 ORF7b:15-44  
N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,  
ORF1b:S1182L,ORF3a:Q57H,ORF3a:M260I,ORF6:Q56\*,S:N439K,S:D614G,S:P681R  
ORF7b:L14- 1-54,29837-29903 ChinaCDC\_N\_F:C28887T  
89599 0 29903 3000.000000 0.000000 good 121  
10.000000 0.000000 good 0 24.000000 -4.000000  
0.000000 good 4.000000 0.000000 good 0  
ORF7b:15-44 1 0 75.000000 mediocre  
ORF6:55 1 75.000000 mediocre

P14 barcode21 20A 6.250000 good 25 0 0 0 17  
0 121 0 1  
C241T,C2003T,C3037T,A3084T,C3768T,C5184T,C6285T,C6651T,G13921A,C1440  
8T,C14724T,C18877T,C20628T,A22320G,C22879A,A23403G,G23593T,G25563T,G26660T  
,C26735T,C28099T,C28232T,C28887T,G29513T,G29744A  
M:L46F,N:T205I,N:A414S,ORF1a:L580F,ORF1a:E940V,ORF1a:T1168I,ORF1a:P164  
0L,ORF1a:T2007I,ORF1a:A2129V,ORF1b:D152N,ORF1b:P314L,ORF3a:Q57H,ORF8:S69L,S:  
D253G,S:N439K,S:D614G,S:Q677H 1-54,29837-29903  
ChinaCDC\_N\_F:C28887T 89609 0 29903 3000.000000  
0.000000 good 121 10.000000 0.000000 good 0

24.000000	6.000000	25.000000	good	14.000000			
0.000000	good	0	0	0	0.000000		
good	0	0.000000	good				

P15 barcode24 20A 0.694444 good 21 4 0 1 12  
1 121 0 2  
C241T,T670C,C1427T,C3037T,C3768T,C5184T,C9073T,C14408T,G17019T,G1802  
7T,C18877T,C19524T,C20436T,C22879A,A23403G,G25563T,C26060T,C26735T,C27406T,  
G28727T,C28887T 26158-26161 ORF3a:257-276  
N:A152S,N:T205I,ORF1a:H388Y,ORF1a:T1168I,ORF1a:P1640L,ORF1b:P314L,ORF  
1b:E1184D,ORF3a:Q57H,ORF3a:T223I,ORF7a:L5F,S:N439K,S:D614G ORF3a:V256-  
1-54,29837-29903 ChinaCDC\_N\_F:C28887T,USCDC\_N3\_P:G28727T  
89606 0 29903 3000.000000 0.000000 good 121  
10.000000 0.000000 good 0 24.000000 2.000000  
8.333333 good 10.000000 0.000000 good 0  
0 ORF3a:257-276 1 0.000000 good 0  
0.000000 good

P16 flowcell1-barcode02 20A 0.000000 good 23 0 0  
0 13 0 121 0 1  
C241T,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C14408T,G160  
75T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,T25264C,G25563T,C26735  
T,C28887T,G29477T,C29718T,C29743T  
N:T205I,N:D402Y,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF  
1b:P314L,ORF1b:D870Y,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R  
1-54,29837-29903 ChinaCDC\_N\_F:C28887T 89617 0  
29903 3000.000000 0.000000 good 121 10.000000  
0.000000 good 0 24.000000 -5.000000 0.000000  
good 3.000000 0.000000 good 0 0  
0 0.000000 good 0 0.000000 good

P17 flowcell1-barcode03 20A 0.000000 good 24 0 0  
0 12 0 121 0 1  
C241T,C683T,T2620C,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C14408  
T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,A25859G,C26256T,  
C26735T,C28887T,G29473A,C29718T,C29743T  
N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,  
ORF1b:S1182L,ORF3a:Q57H,ORF3a:Y156C,S:N439K,S:D614G,S:P681R 1-  
54,29837-29903 ChinaCDC\_N\_F:C28887T 89613 0 29903  
3000.000000 0.000000 good 121 10.000000 0.000000  
good 0 24.000000 -4.000000 0.000000 good

4.000000		0.000000	good	0	0	
0	0.000000	good	0	0.000000	good	
P18 flowcell1-barcode04						
20A	0.000000	good	15	0	0	
0	8	0	122	0	1	
C241T,T670C,C3037T,C3768T,C5184T,C14408T,G18027T,C18877T,C22879A,A23						
403G,G23608T,G25563T,C26735T,G28628T,C28887T						
N:A119S,N:T205I,ORF1a:T1168I,ORF1a:P1640L,ORF1b:P314L,ORF3a:Q57H,S:N43						
9K,S:D614G						
1-54,156,29837-29903		ChinaCDC_N_F:C28887T				
89649	0	29903	3000.000000	0.000000	good	122
10.000000	0.000000	good	0	24.000000	-4.000000	
0.000000	good	4.000000		0.000000	good	0
0	0	0.000000	good	0	0.000000	
good						
P19 flowcell1-barcode05						
20A	0.000000	good	15	0	0	
0	8	0	121	0	1	
C241T,T670C,C3037T,C3768T,C5184T,C14408T,G18027T,C18877T,C22879A,A23						
403G,G23608T,G25563T,C26735T,G28628T,C28887T						
N:A119S,N:T205I,ORF1a:T1168I,ORF1a:P1640L,ORF1b:P314L,ORF3a:Q57H,S:N43						
9K,S:D614G						
1-54,29837-29903		ChinaCDC_N_F:C28887T				
89649	0	29903	3000.000000	0.000000	good	121
10.000000	0.000000	good	0	24.000000	-4.000000	
0.000000	good	4.000000		0.000000	good	0
0	0	0.000000	good	0	0.000000	
good						
P20 flowcell1-barcode06						
20A	0.000000	good	25	0	0	
0	13	0	121	0	1	
C241T,A544G,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C13536						
T,C14408T,C16580T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,C						
26735T,C28647T,C28887T,C29718T,G29736T,C29743T						
N:A125V,N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF						
1b:P314L,ORF1b:T1038I,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R						
1-54,29837-29903		ChinaCDC_N_F:C28887T			89609 0	
29903	3000.000000	0.000000	good	121	10.000000	
0.000000	good	0	24.000000	-3.000000	0.000000	
good	5.000000		0.000000	good	0	0
0	0.000000	good	0	0.000000	good	
P21 flowcell1-barcode07						
20A	0.000000	good	13	0	0	
0	7	0	121	0	1	
C241T,C3037T,C3768T,C5184T,T11434C,C14408T,C18877T,C22879A,A23403G,G						



25563T,C26735T,G28079T,C28887T  
N:T205I,ORF1a:T1168I,ORF1a:P1640L,ORF1b:P314L,ORF3a:Q57H,S:N439K,S:D61  
4G 1-54,29837-29903 ChinaCDC\_N\_F:C28887T 89657  
0 29903 3000.000000 0.000000 good 121 10.000000  
0.000000 good 0 24.000000 -6.000000 0.000000  
good 2.000000 0.000000 good 0 0  
0 0.000000 good 0 0.000000 good

P22 flowcell1-barcode08 20A 0.000000 good 24 0 0  
0 15 0 121 0 1  
C241T,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,G11417T,C12880T,A137  
12G,C14408T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,G26153  
T,T26593C,C26735T,C28887T,C29718T,C29743T  
M:I24T,N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1  
a:V3718F,ORF1b:K82R,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:G254V,S:N439K  
,S:D614G,S:P681R 1-54,29837-29903 ChinaCDC\_N\_F:C28887T  
89613 0 29903 3000.000000 0.000000 good 121  
10.000000 0.000000 good 0 24.000000 -4.000000  
0.000000 good 4.000000 0.000000 good 0  
0 0 0.000000 good 0 0.000000  
good

P23 flowcell1-barcode09 20A 0.694444 good 30 0 0  
0 15 0 121 0 1  
C206T,C241T,C593T,C683T,C3037T,C3096T,T3520C,C3768T,G4504T,C4999T,C51  
84T,C6031T,C11195T,C12880T,C14408T,T16764C,C17012T,T18453C,C18877T,T22219C,C  
22879A,A23403G,C23604G,G24770T,G25563T,C26735T,G27506C,C28887T,C29718T,C29  
743T  
N:T205I,ORF1a:H110Y,ORF1a:S944L,ORF1a:T1168I,ORF1a:E1413D,ORF1a:P1640  
L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF7a:G38A,S:N439K,S:D614  
G,S:P681R,S:A1070S 1-54,29837-29903 ChinaCDC\_N\_F:C28887T  
89589 0 29903 3000.000000 0.000000 good 121  
10.000000 0.000000 good 0 24.000000 2.000000  
8.333333 good 10.000000 0.000000 good 0  
0 0 0.000000 good 0 0.000000  
good

P24 flowcell1-barcode10 20A 0.000000 good 22 0 0  
0 12 0 121 0 1  
C241T,C683T,G709A,C3037T,C3096T,C3768T,C5184T,C11195T,G11417T,C12880  
T,C14408T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,C26735T,C  
28887T,C29718T,C29743T

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:V3718  
 F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R 1-  
 54,29837-29903 ChinaCDC\_N\_F:C28887T 89621 0 29903  
 3000.000000 0.000000 good 121 10.000000 0.000000  
 good 0 24.000000 -6.000000 0.000000 good  
 2.000000 0.000000 good 0 0  
 0 0.000000 good 0 0.000000 good

P25 flowcell11-barcode11 20A 0.000000 good 25 0 0  
 0 14 0 122 0 1  
 C241T,C683T,C3037T,C3096T,C3743T,C3768T,C5184T,C6031T,C11195T,C12439T  
 ,C12880T,C14408T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,C2  
 6735T,G27996T,G28086T,C28887T,C29718T,C29743T

N:T205I,ORF1a:S944L,ORF1a:H1160Y,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644  
 F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF8:D35Y,ORF8:A65S,S:N439K,S:D614G,S:  
 P681R 1-54,14184,29837-29903 ChinaCDC\_N\_F:C28887T  
 89609 0 29903 3000.000000 0.000000 good 122  
 10.000000 0.000000 good 0 24.000000 -3.000000  
 0.000000 good 5.000000 0.000000 good 0  
 0 0 0.000000 good 0 0.000000  
 good

P26 flowcell11-barcode12 20A 0.173611 good 29 0 0  
 0 14 0 121 0 1  
 C241T,C683T,A1249G,C3037T,C3096T,C3768T,C5184T,T5644C,T9853C,C11195T,  
 C12880T,C14408T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,A23632G,A2  
 3764G,G25459T,G25563T,C25624T,C26735T,G27882A,C28887T,G29711C,C29718T,C297  
 43T

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,  
 ORF1b:S1182L,ORF3a:A23S,ORF3a:Q57H,ORF3a:H78Y,ORF7b:A43T,S:N439K,S:D614G,S:P  
 681R 1-54,29837-29903 ChinaCDC\_N\_F:C28887T 89593  
 0 29903 3000.000000 0.000000 good 121 10.000000  
 0.000000 good 0 24.000000 1.000000 4.166667  
 good 9.000000 0.000000 good 0 0  
 0 0.000000 good 0 0.000000 good

P27 flowcell11-barcode13 20A 0.000000 good 22 0 0  
 0 12 0 121 0 1  
 C241T,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C14408T,C1701  
 2T,C18877T,T22219C,C22879A,A23403G,C23604G,G25477A,G25563T,C26735T,C28887T  
 ,C29718T,C29743T,G29751T

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,

ORF1b:S1182L,ORF3a:V29I,ORF3a:Q57H,S:N439K,S:D614G,S:P681R 1-  
 54,29837-29903 ChinaCDC\_N\_F:C28887T 89621 0 29903  
 3000.000000 0.000000 good 121 10.000000 0.000000  
 good 0 24.000000 -6.000000 0.000000 good  
 2.000000 0.000000 good 0 0  
 0 0.000000 good 0 0.000000 good

P28 flowcell11-barcode14 20A 0.173611 good 29 0 0  
 0 14 0 121 0 1

C241T,C683T,A1249G,C3037T,C3096T,C3768T,C5184T,T5644C,T9853C,C11195T,  
 C12880T,C14408T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,A23632G,A2  
 3764G,G25459T,G25563T,C25624T,C26735T,G27882A,C28887T,G29711C,C29718T,C297  
 43T

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,  
 ORF1b:S1182L,ORF3a:A23S,ORF3a:Q57H,ORF3a:H78Y,ORF7b:A43T,S:N439K,S:D614G,S:P  
 681R 1-54,29837-29903 ChinaCDC\_N\_F:C28887T 89593

0 29903 3000.000000 0.000000 good 121 10.000000  
 0.000000 good 0 24.000000 1.000000 4.166667  
 good 9.000000 0.000000 good 0 0  
 0 0.000000 good 0 0.000000 good

P29 flowcell11-barcode16 20A 6.250000 good 25 0 0  
 0 17 0 121 0 1

C241T,C2003T,C3037T,A3084T,C3768T,C5184T,C6285T,C6651T,G13921A,C1440  
 8T,C14724T,C18877T,C20628T,A22320G,C22879A,A23403G,G23593T,G25563T,G26660T  
 ,C26735T,C28099T,C28232T,C28887T,G29513T,G29744A

M:L46F,N:T205I,N:A414S,ORF1a:L580F,ORF1a:E940V,ORF1a:T1168I,ORF1a:P164  
 0L,ORF1a:T2007I,ORF1a:A2129V,ORF1b:D152N,ORF1b:P314L,ORF3a:Q57H,ORF8:S69L,S:  
 D253G,S:N439K,S:D614G,S:Q677H 1-54,29837-29903

ChinaCDC\_N\_F:C28887T 89609 0 29903 3000.000000  
 0.000000 good 121 10.000000 0.000000 good 0  
 24.000000 6.000000 25.000000 good 14.000000  
 0.000000 good 0 0 0 0.000000  
 good 0 0.000000 good

P30 flowcell11-barcode17 20A 0.000000 good 25 1 0  
 1 13 0 121 0 1

C241T,C683T,C3037T,C3096T,C3768T,C5184T,A8734G,C9286T,C11195T,C12880  
 T,C14408T,C17012T,C18115T,C18877T,T22219C,C22879A,C23188T,A23403G,C23604G,C  
 25350T,G25563T,C26735T,C28887T,C29718T,C29743T 26161 ORF3a:257-276

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,  
 ORF1b:S1182L,ORF1b:H1550Y,ORF3a:Q57H,S:N439K,S:D614G,S:P681R,S:P1263L

1-54,29837-29903			ChinaCDC_N_F:C28887T	89599	0	
29903	3000.000000	0.000000	good	121	10.000000	
0.000000	good	0	24.000000	-3.000000	0.000000	
good	5.000000		0.000000	good	0	0
ORF3a:257-276	1	0.000000	good		0	0.000000
good						
P31 flowcell11-barcode20	20A	0.000000	good	24	11	0
0	14	0	121	0	1	
C241T,C683T,C2724T,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C14408						
T,C17004T,C17012T,A17743T,C18877T,T20040C,T22219C,C22879A,A23403G,C23604G,G						
25563T,G25720T,C26735T,C28887T,C29718T 29738-29748						
N:T205I,ORF1a:P820L,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,						
ORF1b:P314L,ORF1b:S1182L,ORF1b:N1426Y,ORF3a:Q57H,ORF3a:A110S,S:N439K,S:D614						
G,S:P681R						
1-54,29837-29903			ChinaCDC_N_F:C28887T			
89574	0	29903	3000.000000	0.000000	good	121
10.000000		0.000000	good	0	24.000000	-3.000000
0.000000	good	5.000000		0.000000	good	0
0	0	0.000000	good		0	0.000000
good						
P32 flowcell11-barcode21	20A	0.000000	good	24	0	0
0	13	0	121	0	2	
C241T,G362A,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C14408						
T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,T25597C,C26735T,T						
28705C,C28887T,C28948T,C29718T,C29743T						
N:T205I,ORF1a:D33N,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,						
ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:W69R,S:N439K,S:D614G,S:P681R						
1-54,29837-29903						
ChinaCDC_N_F:C28887T,ChinaCDC_N_P:C28948T				89613	0	29903
3000.000000	0.000000	good	121	10.000000	0.000000	
good	0	24.000000	-4.000000	0.000000	good	
4.000000		0.000000	good	0	0	
0	0.000000	good		0	0.000000	good
P33 flowcell11-barcode22	20A	1.562500	good	22	0	0
0	12	0	121	0	1	
G174T,C241T,T670C,C3037T,G3755A,C3768T,C5184T,C6638T,C14408T,G18027T						
,C18657T,C18877T,C19524T,C20436T,C21440T,C22879A,A23403G,G25563T,C26060T,C2						
6735T,C28887T,G29402T						
N:T205I,N:D377Y,ORF1a:V1164I,ORF1a:T1168I,ORF1a:P1640L,ORF1a:H2125Y,OR						
F1b:P314L,ORF1b:S2658F,ORF3a:Q57H,ORF3a:T223I,S:N439K,S:D614G 1-						

54,29837-29903                      ChinaCDC\_N\_F:C28887T                      89621 0                      29903  
3000.000000    0.000000                      good    121    10.000000                      0.000000  
good    0                      24.000000                      3.000000                      12.500000                      good  
11.000000                      0.000000                      good    0                      0  
0                      0.000000                      good                      0                      0.000000                      good

P34 flowcell1-barcode23                      20A    0.000000                      good    24                      0                      0  
0                      14                      0                      121                      0                      1  
C241T,C683T,C3037T,C3096T,C3768T,C5184T,T8050C,C11195T,G11417T,C1288  
0T,C14408T,C17012T,G17122A,C18877T,T22219C,C22879A,A23403G,C23604G,C25466T  
,G25563T,C26735T,C28887T,C29718T,C29743T  
N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:V3718  
F,ORF1b:P314L,ORF1b:S1182L,ORF1b:A1219T,ORF3a:P25L,ORF3a:Q57H,S:N439K,S:D614  
G,S:P681R                      1-54,29837-29903                      ChinaCDC\_N\_F:C28887T  
89613 0                      29903 3000.000000    0.000000                      good    121  
10.000000                      0.000000                      good    0                      24.000000                      -4.000000  
0.000000                      good    4.000000                      0.000000                      good    0  
0                      0                      0.000000                      good                      0                      0.000000  
good

P35 flowcell2-barcode01                      20A    0.000000                      good    22                      0                      0  
0                      11                      0                      121                      0                      1  
C241T,C683T,C3037T,C3096T,C3768T,C5184T,T9982C,C11195T,C12880T,C14408  
T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,C26735T,C28887T,C  
29718T,C29743T,G29757T  
N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,  
ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R                      1-54,29837-29903  
ChinaCDC\_N\_F:C28887T                      89621 0                      29903 3000.000000  
0.000000                      good    121    10.000000                      0.000000                      good    0  
24.000000                      -6.000000                      0.000000                      good    2.000000  
0.000000                      good    0                      0                      0                      0.000000  
good                      0                      0.000000                      good

P36 flowcell2-barcode02                      20A    0.000000                      good    24                      0                      0  
0                      14                      0                      122                      0                      1  
C241T,C683T,C3037T,C3096T,C3768T,C5184T,C8251T,C11195T,T11549C,C12880  
T,C14408T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,G25912A,  
C26735T,G27506T,C28887T,C29718T,C29743T  
N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:C3762  
R,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:G174S,ORF7a:G38V,S:N439K,S:D614  
G,S:P681R                      1-54,25521,29837-29903                      ChinaCDC\_N\_F:C28887T  
89613 0                      29903 3000.000000    0.000000                      good    122

10.000000	0.000000	good	0	24.000000	-4.000000
0.000000	good	4.000000		0.000000	good 0
0	0	0.000000	good	0	0.000000
good					

P37 flowcell2-barcode03      20A    0.000000      good    24    0    0  
 0    14    0    121    0    1  
 C241T,C683T,C3037T,C3096T,C3768T,C5184T,C8251T,C11195T,T11549C,C12880  
 T,C14408T,C17012T,C18877T,T22219C,C22879A,A23403G,C23604G,G25563T,G25912A,  
 C26735T,G27506T,C28887T,C29718T,C29743T

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:C3762  
 R,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:G174S,ORF7a:G38V,S:N439K,S:D614  
 G,S:P681R      1-54,29837-29903      ChinaCDC\_N\_F:C28887T  
 89613 0    29903 3000.000000    0.000000    good    121  
 10.000000    0.000000    good    0    24.000000    -4.000000  
 0.000000    good    4.000000         0.000000    good    0  
 0    0    0.000000      good      0    0.000000  
 good

P38 flowcell2-barcode04      20A    28.880672      good    25    0    0  
 0    15    0    1751    0    1

C683T,A1308G,C3037T,C3096T,C3768T,C5184T,C6990T,G10151T,C11195T,C126  
 64T,C12880T,C14408T,G16075T,C17012T,C18877T,T22219C,A23403G,C23604G,G25563  
 T,G26690T,C26735T,C28887T,G29477T,C29718T,C29743T

N:T205I,N:D402Y,ORF1a:N348S,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1  
 a:S2242F,ORF1a:D3296Y,ORF1a:L3644F,ORF1b:P314L,ORF1b:D870Y,ORF1b:S1182L,ORF  
 3a:Q57H,S:D614G,S:P681R      1-342,7093-7332,8636-8913,9246-  
 9502,12169,12774,12778,22878-23144,27512-27808,29837-29903

ChinaCDC_N_F:C28887T	89609	0	29903	3000.000000	
53.740741	mediocre	1751	10.000000	0.000000	good
0	24.000000	-1.000000	0.000000	good	7.000000
0.000000	good	0	0	0	0.000000
good	0	0.000000	good		

P39 flowcell2-barcode05      20A    0.000000      good    27    0    0  
 0    14    0    121    0    1

C241T,C683T,C3037T,C3096T,C3768T,C5184T,A5536G,C11195T,G11417T,C1288  
 0T,C14408T,C17012T,G17035A,C17985T,C18877T,C19170T,T22219C,C22594T,C22879A,  
 A23403G,C23604G,G25563T,C26735T,A27353T,C28887T,C29718T,C29743T

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:V3718  
 F,ORF1b:P314L,ORF1b:S1182L,ORF1b:A1190T,ORF3a:Q57H,ORF6:Q51L,S:N439K,S:D614

G,S:P681R 1-54,29837-29903 ChinaCDC\_N\_F:C28887T  
 89601 0 29903 3000.000000 0.000000 good 121  
 10.000000 0.000000 good 0 24.000000 -1.000000  
 0.000000 good 7.000000 0.000000 good 0  
 0 0 0.000000 good 0 0.000000  
 good

P40 flowcell2-barcode06 20A 0.000000 good 28 0 0  
 0 14 0 156 0 1  
 C241T,G256T,C683T,C2485T,C3037T,C3096T,C3743T,C3768T,C5184T,C6402T,C7  
 735T,C11195T,C12880T,C14408T,A14412G,C17012T,C18877T,A21390G,T22219C,C2232  
 6T,C22879A,A23403G,C23604G,G25563T,C26735T,C28887T,C29718T,C29743T

N:T205I,ORF1a:S944L,ORF1a:H1160Y,ORF1a:T1168I,ORF1a:P1640L,ORF1a:P204  
 6L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,S:S255F,S:N439K,S:D614G,S:  
 P681R 1-54,3292-3325,11514,29837-29903 ChinaCDC\_N\_F:C28887T  
 89597 0 29903 3000.000000 0.000000 good 156  
 10.000000 0.000000 good 0 24.000000 0.000000  
 0.000000 good 8.000000 0.000000 good 0  
 0 0 0.000000 good 0 0.000000  
 good

P41 flowcell2-barcode07 20A 0.000000 good 22 0 0  
 0 12 0 121 0 1  
 C241T,C683T,C3037T,C3096T,C3768T,C5184T,C11195T,C12880T,C14408T,C1701  
 2T,C18877T,T22219C,C22879A,A23403G,C23604G,A23764G,G25563T,C26735T,G27882  
 A,C28887T,C29718T,C29743T

N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,  
 ORF1b:S1182L,ORF3a:Q57H,ORF7b:A43T,S:N439K,S:D614G,S:P681R 1-  
 54,29837-29903 ChinaCDC\_N\_F:C28887T 89621 0 29903  
 3000.000000 0.000000 good 121 10.000000 0.000000  
 good 0 24.000000 -6.000000 0.000000 good  
 2.000000 0.000000 good 0 0  
 0 0.000000 good 0 0.000000 good

## Lampiran Analisis SPSS untuk Hubungan Antara Komorbid dan Severitas

Catatan:

Total sampel terinfeksi SARS-COV2 dengan mutasi D614G: 41 (100%)

Severitas: 0 : Asimptomatik dan Ringan

1 : Sedang dan Berat

ESTIMASI PARAMETER MODEL REGRESI LOGISTIK				
Variabel	Faktor Resiko	Nilai Eksponen	95% Confidence Interval	
			Nilai Terendah	Nilai Tertinggi
Jenis Kelamin	Laki-laki	4,205	0,557	31,723
	Perempuan	1	.	.
Kelompok Usia	Anak	0,353	0,010	12,743
	Dewasa	0,671	0,063	7,133
	Lansia	1	.	.
Komorbid	Tanpa Komorbid	0,033	0,004	0,264
	Ada Komorbid	1	.	.



## LAMPIRAN DATA REKAM MEDIS PASIEN DAN LETAK MUTASI ASAM AMINO

N o.	KODE PASIEN	JENIS KELAMIN	NILAI CT	USIA	PEKERJAAN	KONTAK ERAT	DOMISILI	KOMORBID	GEJALA PENYAKIT	SEVERITAS	MUTASI ASAM AMINO
1	P1	LAKI-LAKI	21,75	68 tahun 5 bulan	HCW	ADA	MAKASSAR	TIDAK ADA	lemas, nyeri otot dan sendi	ringan	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:T1788M,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H, ORF3a:R68K,S:N439K,S:D614G,S:P681R
2	P2	LAKI-LAKI	19,98	35 tahun 9 bulan	HCW	ADA	MAKASSAR	TIDAK ADA	batuk, demam, diare, nyeri tenggorokan	ringan	N:T205I,ORF1a:T1168I,ORF1a:P1640F,ORF1b:P314L,ORF1b:R2308C,ORF3a:Q57H, S:N439K,S:D614G
3	P3	PEREMPUAN	21,44	54 tahun 3 bulan	NHCW	ADA	MAROS	TIDAK ADA	batuk, pilek	ringan	N:T205I,ORF1a:E1013G,ORF1a:T1168I,ORF1a:P1640L,ORF1a:G2322C,ORF1a:S2500F,ORF1b:P314L,ORF3a:Q57H,ORF3a:T223I, S:N439K,S:D614G
4	P4	PEREMPUAN	18,01	26 tahun 5 bulan	HCW	ADA	MAKASSAR	TIDAK ADA	batuk	ringan	N:T205I,N:A251V,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:I35T,ORF3a:Q57H,S:N439K,S:D614G,S:P681R
5	P5	PEREMPUAN	19,80	39 tahun 9 bulan	HCW	TIDAK ADA	MAKASSAR	TIDAK ADA	demam, anosmia, pilek	ringan	N:T205I,ORF1a:T1168I,ORF1a:T1558A,ORF1a:P1640L,ORF1a:N1651T,ORF1b:P314L,ORF1b:A2401S,ORF3a:Q57H,ORF3a:T223I, S:N439K,S:D614G
6	P6	LAKI-LAKI	23,75	78 tahun 11 bulan	NHCW	TIDAK ADA	MAKASSAR	ASMA AKUT RINGAN SEDANG	sesak	sedang	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:V3718F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H, S:N439K,S:D614G,S:P681R
7	P7	PEREMPUAN	19,66	25 tahun 11 bulan	NHCW	ADA	MAKASSAR	TIDAK ADA	tanpa keluhan	asimtomatik	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:Y1859H,ORF1a:D2032G,ORF1a:P2046L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:K21N,ORF3a:Q57H,ORF7a:Y97F, S:V143F,S:N439K,S:D614G,S:P681R

8	P8	LAKI-LAKI	22,05	32 tahun 5 bulan	HCW	ADA	MAKASSAR	TIDAK ADA	tanpa keluhan	asimtomatik	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:L4037F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H, S:A348S,S:N439K,S:D614G,S:P681R
9	P9	LAKI-LAKI	21,29	54 tahun 4 bulan	NHCW	TIDAK ADA	MAKASSAR	TIDAK ADA	tanpa keluhan	asimtomatik	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G, S:P681R
10	P10	PEREMPUAN	22,44	33 tahun 7 bulan	HCW	ADA	MAKASSAR	TIDAK ADA	lemas, demam	ringan	N:A125V,N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:T1038I,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R
11	P11	LAKI-LAKI	19,9	33 tahun 11 bulan	HCW	ADA	MAKASSAR	TIDAK ADA	demam	ringan	N:A125V,N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:T1038I,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R
12	P12	PEREMPUAN	18,75	51 tahun 11 bulan	HCW	ADA	MAKASSAR	PNEUMONIA UNSPECIFIED, ESSENTIAL (PRIMARY)HYPERTENSION, ANXIETY DISORDER, MODERATE PROTEIN-ENERGY MALNUTRITION	sesak	sedang	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:V1187I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H, S:N439K,S:D614G,S:P681R
13	P13	PEREMPUAN	16,04	4 tahun 4 bulan	NHCW	ADA	MAKASSAR	TIDAK ADA	tanpa keluhan	asimtomatik	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:M260I,ORF6:Q56*,ORF7b:L14X,S:N439K,S:D614G,S:P681R
14	P14	LAKI-LAKI	17,36	60 tahun 11 bulan	NHCW	ADA	MAKASSAR	TIDAK ADA	Saturasi 94%	berat	M:L46F,N:T205I,N:A414S,ORF1a:L580F,ORF1a:E940V,ORF1a:T1168I,ORF1a:P1640L,ORF1a:T2007I,ORF1a:A2129V,ORF1b:D152N,ORF1b:P314L,ORF3a:Q57H,ORF8:S69L, S:D253G,S:N439K,S:D614G,S:Q677H
15	P15	PEREMPUAN	18,54	30 tahun 8 bulan	HCW	ADA	MAROS	TIDAK ADA	tanpa keluhan	asimtomatik	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF7a:V24F, S:N439K,S:D614G,S:P681R

16	P16	PEREMPUAN	22,39	57 tahun 9 bulan	NHCW	ADA	MAKASSAR	HIPERTENSI	sesak, batuk	sedang	N:T205I,N:D402Y,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:D870Y,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R
17	P17	LAKI-LAKI	18,21	26 tahun 2 bulan	NHCW	ADA	BONE	TIDAK ADA	sesak dan batuk	sedang	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:Y156C,S:N439K,S:D614G,S:P681R
18	P18	LAKI-LAKI	24,2	63 tahun 7 bulan	NHCW	ADA	MAKASSAR	TIDAK ADA	anosmia	ringan	N:A119S,N:T205I,ORF1a:T1168I,ORF1a:P1640L,ORF1b:P314L,ORF3a:Q57H,S:N439K,S:D614G
19	P19	PEREMPUAN	18,89	54 tahun 8 bulan	NHCW	ADA	MAKASSAR	HYPERTENSIVE HEART DISEASE (CONGESTIVE ) HEART FAILURE DAN NON DEPENDENT INSULIN DIABETES MELLITUS	tanpa keluhan	asimptomatik	N:A119S,N:T205I,ORF1a:T1168I,ORF1a:P1640L,ORF1b:P314L,ORF3a:Q57H,S:N439K,S:D614G
20	P20	LAKI-LAKI	22,58	4 tahun 4 bulan	NHCW	TIDAK ADA	MAKASSAR	TIDAK ADA	demam	ringan	N:A125V,N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:T1038I,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R
21	P21	LAKI-LAKI	23,84	71 tahun 11 bulan	NHCW	ADA	MAKASSAR	HIPERTENSI TERKONTROL DENGAN OBAT, GOUT	demam	ringan	N:T205I,ORF1a:T1168I,ORF1a:P1640L,ORF1b:P314L,ORF3a:Q57H,S:N439K,S:D614G
22	P22	LAKI-LAKI	24,21	33 tahun 4 bulan	NHCW	ADA	MAKASSAR	TIDAK ADA	tanpa keluhan	asimptomatik	M:I24T,N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:V3718F,ORF1b:K82R,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:G254V,S:N439K,S:D614G,S:P681R
23	P23	PEREMPUAN	14,45	28 tahun 5 bulan	HCW	TIDAK ADA	MAKASSAR	TIDAK ADA	batuk	ringan	N:T205I,ORF1a:H110Y,ORF1a:S944L,ORF1a:T1168I,ORF1a:E1413D,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF7a:G38A,S:N439K,S:D614G,S:P681R,S:A1070S

24	P24	LAKI-LAKI	24,19	51 tahun 3 bulan	NHCW	TIDAK ADA	MAKASSAR	DIABETES MELLITUS, DAN HIPERTENSI ON TREATMENT	sesak, batuk	sedang	N:T205I,ORF1a:S944L,ORF1a:T 1168I,ORF1a:P1640L,ORF1a:L3 644F,ORF1a:V3718F,ORF1b:P3 14L,ORF1b:S1182L,ORF3a:Q57 H,S:N439K,S:D614G,S:P681R
25	P25	LAKI-LAKI	22,64	48 tahun 10 bulan	NHCW	TIDAK ADA	MAKASSAR	THYMOMA	sesak,saturasi 95 %	sedang	N:T205I,ORF1a:S944L,ORF1a:H 1160Y,ORF1a:T1168I,ORF1a:P 1640L,ORF1a:L3644F,ORF1b:P 314L,ORF1b:S1182L,ORF3a:Q5 7H,ORF8:D35Y,ORF8:A65S,S:N 439K, S:D614G,S:P681R
26	P26	PEREMPUAN	21,34	29 tahun 11 bulan	NHCW	ADA	MAKASSAR	SLE	sesak, batuk, lemas, saturasi 89%	berat	N:T205I,ORF1a:S944L,ORF1a:T 1168I,ORF1a:P1640L,ORF1a:L3 644F,ORF1b:P314L,ORF1b:S11 82L,ORF3a:A23S,ORF3a:Q57H, ORF3a:H78Y,ORF7b:A43T,S:N4 39K, S:D614G,S:P681R
27	P27	LAKI-LAKI	23,94	34 tahun 8 bulan	HCW	ADA	MAKASSAR	TIDAK ADA	tanpa keluhan	asimtomatik	N:T205I,ORF1a:S944L,ORF1a:T 1168I,ORF1a:P1640L,ORF1a:L3 644F,ORF1b:P314L,ORF1b:S11 82L,ORF3a:V29I,ORF3a:Q57H,S :N439K,S:D614G,S:P681R
28	P28	LAKI-LAKI	24,12	45 tahun 10 bulan	NHCW	ADA	PANGKEP	HIPERTENSI, OBESITAS	batuk	ringan	N:T205I,ORF1a:S944L,ORF1a:T 1168I,ORF1a:P1640L,ORF1a:L3 644F,ORF1b:P314L,ORF1b:S11 82L,ORF3a:A23S,ORF3a:Q57H, ORF3a:H78Y,ORF7b:A43T,S:N4 39K, S:D614G,S:P681R
29	P29	PEREMPUAN	18,34	60 tahun 8 bulan	NHCW	TIDAK ADA	MAROS	ANEMIA APLASTIK DAN HIPERTENSI	demam	ringan	M:L46F,N:T205I,N:A414S,ORF1 a:L580F,ORF1a:E940V,ORF1a:T 1168I,ORF1a:P1640L,ORF1a:T2 007I,ORF1a:A2129V,ORF1b:D1 52N,ORF1b:P314L,ORF3a:Q57 H,ORF8:S69L,S:D253G,S:N439K ,S:D614G, S:Q677H
30	P30	LAKI-LAKI	24,61	46 tahun 9 bulan	NHCW	ADA	MAKASSAR	HIPERTENSI TIDAK TERKENDALI, OBESITAS	sesak, demam, batuk	sedang	N:T205I,ORF1a:S944L,ORF1a:T 1168I,ORF1a:P1640L,ORF1a:L3 644F,ORF1b:P314L,ORF1b:S11 82L,ORF1b:H1550Y,ORF3a:Q5 7H,S:N439K,S:D614G,S:P681R, S:P1263L

31	P31	PEREMPUAN	23,25	69 tahun 11 bulan	NHCW	TIDAK ADA	MAKASSAR	TB	tanpa keluhan	asimptomatik	N:T205I,ORF1a:P820L,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF1b:N1426Y,ORF3a:Q57H,ORF3a:A110S,S:N439K,S:D614G,S:P681R
32	P32	Laki-Laki	19,13	24 tahun 9 bulan	NHCW	TIDAK ADA	MAKASSAR	TIDAK ADA	tanpa keluhan	asimptomatik	N:T205I,ORF1a:D33N,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:W69R,S:N439K,S:D614G,S:P681R
33	P33	Laki-Laki	23,32	38 tahun 7 bulan	NHCW	TIDAK ADA	MAKASSAR	CKD ON HD REGULER, TRANSIENT TROMBOSITOPENIA	sesak, batuk, demam	sedang	N:T205I,N:D377Y,ORF1a:V1164I,ORF1a:T1168I,ORF1a:P1640L,ORF1a:H2125Y,ORF1b:P314L,ORF1b:S2658F,ORF3a:Q57H,ORF3a:T223I,S:N439K,S:D614G
34	P34	PEREMPUAN	20,37	29 tahun 10 bulan	HCW	ADA	BULUKUMBA	TIDAK ADA	batuk, anosmia	ringan	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:V3718F,ORF1b:P314L,ORF1b:S1182L,ORF1b:A1219T,ORF3a:P25L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R
35	P35	LAKI-LAKI	21,73	2 tahun 1 bulan	NHCW	ADA	MAKASSAR	TIDAK ADA	demam	ringan	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:C3762R,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,S:N439K,S:D614G,S:P681R
36	P36	LAKI-LAKI	15,68	29 tahun 10 bulan	NHCW	ADA	MOROWALI	TIDAK ADA	tanpa keluhan	asimptomatik	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:C3762R,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:G174S,ORF7a:G38V,S:N439K,S:D614G,S:P681R
37	P37	LAKI-LAKI	21,84	35 tahun 7 bulan	HCW	TIDAK ADA	BUTON	TIDAK ADA	tanpa keluhan	asimptomatik	N:T205I,ORF1a:S944L,ORF1a:T1168I,ORF1a:P1640L,ORF1a:L3644F,ORF1a:C3762R,ORF1b:P314L,ORF1b:S1182L,ORF3a:Q57H,ORF3a:G174S,ORF7a:G38V,S:N439K,S:D614G,S:P681R

38	P38	PEREMPUAN	23,11	35 tahun 1 bulan	NHCW	ADA	MAKASSAR	TIDAK ADA	pilek, anosmia	ringan	N:T205I,N:D402Y,ORF1a:N348 S,ORF1a:S944L,ORF1a:T1168I, ORF1a:P1640L,ORF1a:S2242F, ORF1a:D3296Y,ORF1a:L3644F, ORF1b:P314L,ORF1b:D870Y,O RF1b:S1182L,ORF3a:Q57H,S:D 614G,S:P681R
39	P39	PEREMPUAN	20,02	31 tahun 5 bulan	NHCW	ADA	MAKASSAR	TIDAK ADA	demam, batuk	ringan	N:T205I,ORF1a:S944L,ORF1a:T 1168I,ORF1a:P1640L,ORF1a:L3 644F,ORF1a:V3718F,ORF1b:P3 14L,ORF1b:S1182L,ORF1b:A11 90T,ORF3a:Q57H,ORF6:Q51L,S :N439K, S:D614G,S:P681R
40	P40	PEREMPUAN	19,13	29 tahun 6 bulan	NHCW	ADA	BULUKUMBA	TIDAK ADA	tanpa keluhan	asimptomatik	N:T205I,ORF1a:S944L,ORF1a:H 1160Y,ORF1a:T1168I,ORF1a:P 1640L,ORF1a:P2046L,ORF1a:L 3644F,ORF1b:P314L,ORF1b:S1 182L,ORF3a:Q57H,S:S255F,S:N 439K, S:D614G,S:P681R
41	P41	PEREMPUAN	24,06	24 tahun 10 bulan	NHCW	TIDAK ADA	MAKASSAR	TIDAK ADA	tanpa keluhan	asimptomatik	N:T205I,ORF1a:S944L,ORF1a:T 1168I,ORF1a:P1640L,ORF1a:L3 644F,ORF1b:P314L,ORF1b:S11 82L,ORF3a:Q57H, ORF7b:A43T,S:N439K,S:D614G ,S:P681R





KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN  
UNIVERSITAS HASANUDDIN FAKULTAS KEDOKTERAN  
KOMITE ETIK PENELITIAN KESEHATAN  
RSPTN UNIVERSITAS HASANUDDIN  
RSUP Dr. WAHIDIN SUDIROHUSODO MAKASSAR  
Sekretariat : Lantai 2 Gedung Laboratorium Terpadu



Jl. PERINTIS KEMERDEKAAN KAMPUS TAMALANREA KM.10 MAKASSAR 90045.

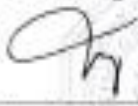


Contact Person: dr. Agussalim Bukhari, M.Med, Ph.D., Sp.GK. TELP. 081241850858, 0411 5780303, Fax : 0411-580431

### REKOMENDASI PERSETUJUAN ETIK

Nomor : 845/UN4.6.4.5.31/ PP36/ 2020

Tanggal: 30 Desember 2020

Dengan ini Menyatakan bahwa Protokol dan Dokumen yang Berhubungan Dengan Protokol berikut ini telah mendapatkan Persetujuan Etik :

No Protokol	UH20110625	No Sponsor Protokol	
Peneliti Utama	<b>Prof. Muh Nasrum Massi, PhD, SpMK</b>	Sponsor	
Judul Peneliti	Genotipe Rekombinan Baru Virus Corona Strain Lokal Sulawesi Sebagai Alat Diagnostik Baru Berbasis Molekuler		
No Versi Protokol	1	Tanggal Versi	4 November 2020
No Versi PSP	1	Tanggal Versi	4 November 2020
Tempat Penelitian	RS Universitas Hasanuddin Makassar		
Jenis Review	<input type="checkbox"/> Exempted <input checked="" type="checkbox"/> Expedited <input type="checkbox"/> Fullboard Tanggal	Masa Berlaku 30 Desember 2020 sampai 30 Desember 2021	Frekuensi review lanjutan
Ketua Komisi Etik Penelitian Kesehatan FKUH	Nama <b>Prof.Dr.dr. Suryani As'ad, M.Sc.,Sp.GK (K)</b>	Tanda tangan 	
Sekretaris Komisi Etik Penelitian Kesehatan FKUH	Nama <b>dr. Agussalim Bukhari, M.Med.,Ph.D.,Sp.GK (K)</b>	Tanda tangan 	

Kewajiban Peneliti Utama:

- Menyerahkan Amandemen Protokol untuk persetujuan sebelum di implementasikan
- Menyerahkan Laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan Laporan SUSAR dalam 72 Jam setelah Peneliti Utama menerima laporan
- Menyerahkan Laporan Kemajuan (progress report) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah
- Menyerahkan laporan akhir setelah Penelitian berakhir
- Melaporkan penyimpangan dari protokol yang disetujui (protocol deviation / violation)
- Mematuhi semua peraturan yang ditentukan