This is a supplement file of Poster #EE29 presented at ISPOR Europe 2023.

1 Model Structure

- A combined decision tree–Markov model was developed (Figure 2B), which has been previously presented[1,2]. Briefly, upon symptomatic infection, the cohort is distributed by COVID-19 severity in terms of hospitalisation and maximum level of oxygen support during hospitalisation[3]. Following the acute phase, patients can experience acute death, acquire PACS or recover, with asymptomatic infections assumed to not experience PACS.

- In the post-acute phase (Markov model with six-month cycles), patients remain in the PACS health state or recover from PACS. Patients can experience death from both health states, with excess mortality attributed according to the severity of acute infection and the presence of PACS.

- PrEP effect is captured as a relative risk reduction in symptomatic infections and hospitalisations (by severity). The protective effect of PrEP is not considered beyond 6 months or 1-year timeframes defined across scenarios.

2 Model inputs

2.1 Clinical Inputs

2.1.1 Acute Phase

- The risk of symptomatic infection (RoSI) over 6 months (6.61% May 2022 to November 2022 and 23.58% November 2021 to May 2022) or 1 year (30.40% November 2021 to November 2022) was derived from the Swiss Federal Office of Public Health (FOPH) 2023 data[4]. Upon symptomatic infection, the risk of hospitalization (RoH) was 8.8% (Israeli observational study of ICIs during the BA.1/BA.2 waves)[5], with the distribution of inpatient levels of care based on a recent UK study (40.1% no oxygen, 44.8% low-flow oxygen, 11.8% non-invasive ventilation/high-flow oxygen/CPAP, 3.3% IMV [Invasive Mechanical Ventilation] or ECMO [Extracorporeal Membrane Oxygenation], see Figure 2B)[6]

- No acute death was assumed for ambulatory infections, while the risk of inpatient acute death were based on published literature (7.7% no oxygen, 12.6% low-flow oxygen, 30.9% ventilation/high-flow oxygen/CPAP, 51.6% IMV or ECMO, see Figure 2B).[6-8]

- The risk of PACS following symptomatic infection was estimated at 12.7% for ambulatory cases[9], with all hospitalised patients assumed to experience PACS at the time of discharge in line with NICE TA900 (assessment of T+C)[10], with a 6-month recovery probability of 20.42% (Figure 2B) [11].

2.1.2 Post Acute Phase

- The risk of death unrelated to COVID-19 in the post-acute phase was based on life tables from the Swiss Federal Statistical Office[12] [13], adjusted by an HR of 1.7[14], to reflect ICIs excess mortality vs. the general population.

- Individuals in the recovered states only experienced excess mortality (HR=1.33) [15,16] if the acute infection required high-flow oxygen or IMV, to capture the long-term impact of severe hospitalisation. On the contrary, all ICIs with PACS post-infection experienced excess mortality

(HR=1.29-5.68) [17], with more severe acute infection associated with higher post-acute consequences.

2.1.3 PrEP Effectiveness vs. No PrEP

- T+C effectiveness against infection and hospitalisations during the Omicron wave was based on an SLR and meta-analyses of RWE studies, which estimated a relative risk reduction (RRR) of 75% against infection and 77%-86% RRRs against hospitalisations, stratified by level of inpatient care (see box at the bottom of Figure 2B).[18]

2.2 Costs

- The economic consequences of PrEP vs. no PrEP were derived by multiplying the symptomatic cases prevented, hospitalisations prevented, bed days prevented and PACS cases prevented by the estimated costs associated with each type of event, from a Swiss payer perspective. The following cost inputs were considered.
    - Outpatient treatment with Paxlovid™ (nirmatrelvir-ritonavir)[19] and inpatient treatment with dexamethasone and tocilizumab[20], following Swiss FOPH guidelines[21,22]
    - Cost of COVID-19 hospitalisation stratified by severity of inpatient care (CHF 6,849 – CHF 56,888[23])
    - Monitoring costs (2 X-rays and 6 GP visits in the first year post-discharge[24,25])
    - Yearly cost of chronic fatigue as a proxy for PACS cost (CHF 3,704) [26,27]
- The costs per clinical outcome are not mutually exclusive, with the estimated average cost per symptomatic case, for instance, including outpatient and inpatient treatment costs, hospitalisation costs, monitoring costs and PACS costs.

References

1. Squirrell D, Jandu J, Holland T, et al. The Economic Impact of a Psychosocial Utility Benefit Associated with Pre-Exposure Prophylaxis (PrEP) for COVID-19 in Individuals Who Are Immunocompromised (IC) – a Case Study for Future PrEP Evaluations. ISPOR 2023,; 07–10 May 2023, 2023; Boston, Massachusetts.
2. Sutton K, Miller P, Branscombe N, et al. *EE572 Cost-Effectiveness of AZD7442 (Tixagevimab and Cilgavimab) for Pre-exposure Prophylaxis Against COVID-19 in the Immunocompromised Population.* Value Health. 2022 Dec;25(12):S168. doi: 10.1016/j.jval.2022.09.812. Epub 2022 Dec 14.
3. Marshall JC, Murthy S, Diaz J, et al. A minimal common outcome measure set for COVID-19 clinical research. *The Lancet Infectious Diseases.* 2020;20(8):e192-e197.
4. Swiss Federal Office of Public Health (FOPH). COVID-19 Switzerland - Information on the current situation. . https://www.covid19.admin.ch/en/epidemiologic/case. Published 2023. Accessed 30 March, 2023.
5. Kertes J, Shapiro Ben David S, Engel-Zohar N, et al. Association Between AZD7442 (Tixagevimab-Cilgavimab) Administration and Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infection, Hospitalization, and Mortality. *Clinical Infectious Diseases.* 2022.
6. Turtle L, Thorpe M, Drake TM, et al. Outcome of COVID-19 in hospitalised immunocompromised patients: An analysis of the WHO ISARIC CCP-UK prospective cohort study. *PLoS Med.* 2023;20(1):e1004086.
7. Intensive Care National Audit & Research Centre (ICNARC). ICNARC report on COVID-19 in critical care: England, Wales and Northern Ireland. 17 February 2023. https://www.icnarc.org/our-audit/audits/cmp/reports. Published 2023. Accessed 4th April 2023.
8. Ohsfeldt RL, Choong CK, Mc Collam PL, Abedtash H, Kelton KA, Burge R. Inpatient Hospital Costs for COVID-19 Patients in the United States. *Adv Ther.* 2021;38(11):5557-5595.
9. Ballering AV, van Zon SKR, Olde Hartman TC, Rosmalen JGM. Persistence of somatic symptoms after COVID-19 in the Netherlands: an observational cohort study. *Lancet.* 2022;400(10350):452-461.
10. National Institute for Health and Care Excellence (NICE). Tixagevimab plus cilgavimab for preventing COVID-19 [ID6136] - draft guidance. https://www.nice.org.uk/guidance/indevelopment/gid-ta11102. Accessed 4th April 2023.
11. Office for National Statistics. Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK: 30 March 2023. https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/prevalenceofongoingsymptomsfollowingcoronaviruscovid19infectioninthe uk/30march2023. Published 2023. Accessed 4 April 2023.
12. Swiss Federal Statistical Office. Vollständige jährliche Sterbetafel (Männer), 2013-2021. https://www.bfs.admin.ch/asset/de/23328832. Published 2022. Accessed 30 March, 2023.
13. Swiss Federal Statistical Office. Vollständige jährliche Sterbetafel (Frauen), 2013-2021. https://www.bfs.admin.ch/asset/de/23329001. Published 2022. Accessed 30 March, 2023.
14. Odnoletkova I, Kindle G, Quinti I, et al. The burden of common variable immunodeficiency disorders: a retrospective analysis of the European Society for Immunodeficiency (ESID) registry data. *Orphanet J Rare Dis.* 2018;13(1):201.

15. Sheinson D, Dang J, Shah A, Meng Y, Elsea D, Kowal S. A Cost-Effectiveness Framework for COVID-19 Treatments for Hospitalized Patients in the United States. *Adv Ther.* 2021;38(4):1811-1831.
16. Lone NI, Gillies MA, Haddow C, et al. Five-Year Mortality and Hospital Costs Associated with Surviving Intensive Care. *Am J Respir Crit Care Med.* 2016;194(2):198-208.
17. Al-Aly Z, Bowe B, Xie Y. Long COVID after breakthrough SARS-CoV-2 infection. *Nat Med.* 2022;28(7):1461-1467.
18. Alhumaid S, Al Mutair A, Alali J, et al. Efficacy and Safety of Tixagevimab/Cilgavimab to Prevent COVID-19 (Pre-Exposure Prophylaxis): A Systematic Review and Meta-Analysis. *Diseases.* 2022;10(4).
19. Swiss Federal Office of Public Health (FOPH). Paxlovid®: Bestellung, Abgabe und Abrechnung für Apotheken. https://www.bag.admin.ch/dam/bag/de/dokumente/biomed/heilmittel/COVID-19/bestellung_abrechnung_apotheke.pdf.download.pdf/Bestellung%20bis%20Abrechnung-Apotheke.pdf. Published 2023. Accessed 3 April, 2023.
20. Swiss Federal Office of Public Health (FOPH). Präparate Spezialitätenliste (mit Geburtsgebrechen-Spezialitätenliste). https://www.xn--spezialittenliste-yqb.ch/ShowPreparations.aspx. Published 2023. Accessed 3 April, 2023.
21. Swiss Society of Infectious Diseases (SSI). Recommendations for the use of early COVID-19 therapy and prophylaxis. https://www.bag.admin.ch/dam/bag/en/dokumente/biomed/heilmittel/COVID-19/ak-kriterienliste-ssi.pdf.download.pdf/Kriterienliste_SSI_E.pdf. Accessed 30 March, 2023.
22. Swiss Society of Infectious Diseases (SSI). SARS-CoV-2 /COVID-19 - Antiviral and immunomodulatory treatment considerations for hospitalized patients (continually updated). https://ssi.guidelines.ch/guideline/3352. Accessed 3 April, 2023.
23. Swiss DRG. Fallpauschalen-Katalog version12.0. https://www.swissdrg.org/de/akutsomatik/swissdrg-system-1202023/fallpauschalenkatalog. Published 2023. Accessed.
24. FMH Swiss Medical Association. Tarmed Darabase. https://browser.tartools.ch/#/tarmed_kvg. Published 2022. Accessed 3 April 2023.
25. Rafia R, Martyn-St James M, Harnan S, Metry A, Hamilton J, Wailoo A. A Cost-Effectiveness Analysis of Remdesivir for the Treatment of Hospitalized Patients With COVID-19 in England and Wales. *Value Health.* 2022;25(5):761-769.
26. Hunter RM JM, Paxman J.,. Counting the cost: Chronic fagitue syndrome /Myalgicencephalomyelitis. 2020health.org. https://meassociation.org.uk/wp-content/uploads/2020Health-Counting-the-Cost-Sept-2017.pdf. Published 2017. Accessed 12 December, 2022.
27. OECD data. Purchasing power parities (PPP). https://data.oecd.org/conversion/purchasing-power-parities-ppp.htm. Published 2023. Accessed 13 April, 2023.