

distribute masks, gloves, and therapies to patients. Unfortunately the fundraising activities suffered due to the lockdown, and the main problems were related to social distancing and lack of public campaigns. The institutional relationships have increased during the COVID-19 pandemic and they mainly regarded the participation in legislative interventions. Among the initiatives adopted, our sampled associations affirmed that they would like to maintain the social support provided to patients experienced during the pandemic. Finally we calculated a resiliency score and we discovered that the majority of the sampled associations developed an intermediate level of resiliency and that it is positively correlated with their tenure. **Conclusions.** Our results provide a fresh view about the role of patient advocacy associations during the pandemic indicate their important role within the NHS.

## PP85 The Cost-Effectiveness Of The Anti-COVID Vaccination Campaign In The Italian Healthcare Setting

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**Introduction.** Coronavirus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Symptoms of COVID-19 are variable, but often include fever, cough, headache, fatigue, breathing difficulties, and loss of smell and taste. Symptoms may begin one to fourteen days after exposure to the virus. COVID-19 transmits when people breathe in air contaminated by droplets and small airborne particles containing the virus. The present analysis aims to define the cost-effectiveness profile of the anti-COVID vaccination campaign in the Italian healthcare setting.

**Methods.** The analysis was based on the collection and analysis of data regarding the number of hospitalizations (ordinary regime and intensive care) and infections recorded by the Italian Ministry of Health in vaccinated and unvaccinated patient cohorts. The acquisition costs of the available vaccine alternatives were considered as well as the cost of the personnel involved in the vaccination campaign. The reduction in hospitalizations was considered as a measure of effectiveness. We have compared the current scenario of campaign vaccination versus a scenario in which the total of the eligible population would be vaccinated. Results are reported in terms of Incremental Cost Effectiveness Ratio (ICER). Deterministic and probabilistic sensitivity analyses were carried out in order to test the robustness of the results.

**Results.** The vaccination campaign allowed for savings amounting to EUR 9,398,012.10 (EUR 60,499,053.25 vs EUR 69,897,065.35) and 6,647 hospitalizations avoided (715 and 5,932 in the intensive care and ordinary regimen, respectively), thus resulting a dominant strategy as compared with the alternative (no vaccination). As the cost-effectiveness profile of the campaign improves, we should consider

the period (May-July 2021), during which the daily threshold of 500,000 doses administered on a national basis was consistently exceeded.

**Conclusions.** The analysis underlined how the vaccination campaign represents a cost-saving alternative in the Italian healthcare setting.

## PP88 Bayesian Joint Models For Cost-Effectiveness Analyses Based On Clustered Participant Data, With Implementation In Stan

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**Introduction.** Cost-effectiveness analyses of empirical participant data are frequently complicated by irregularly distributed and correlated observations, which are not well approximated by normal distributions. Things get even more difficult when observations are clustered within higher level units (for example, hospitals) or the participant (that is, multiple measurements at different timepoints). Therefore, we developed a flexible Bayesian approach to jointly model costs and effects of two competing interventions with a multilevel structure.

**Methods.** Our new model is presented in mathematical form and discussed in detail. We model costs and Quality-Adjusted Life-Years effects through Gamma and Beta distributions, and account for the dependency between costs and effects by adding the effects as a predictor for the costs. We further include hurdle models to account for costs of for the presence of zero costs and perfect health scores. The full model is implemented in the probabilistic programming language Stan. To compare the performance of our Bayesian model to a frequentist approach (linear mixed model combined with bootstrapping), we simulate 1000 datasets consisting of 400 participants and 20 clusters. Performance of both models is assessed in terms of variance, bias and coverage probability with respect to the costs and effects defined in the simulation.

**Results.** We ran a preliminary simulation with high intraclass correlation, strong negative correlation for patient-level costs and effects, and positive correlation of cluster effects on both outcomes. The analysis shows that the Bayesian model exhibits a slightly larger bias for estimated costs, but smaller errors and higher coverage probability compared to the frequentist alternative. We will explore different scenarios where we vary the parameters of the simulations and assess whether the results are robust to change.

**Conclusions.** It is very important that economic evaluations in health care produce precise and reliable results. Our Bayesian approach is able to handle multiple statistical complexities at once and performs better than a comparable frequentist model. Whether this conclusion holds for different simulation scenarios will be explored in further stages of this study.