**The SARS-CoV-2 Spike Protein Mutation Explorer: Using Visualisations and Interactivity for Improved Communication about Variants of Concern**

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Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is the cause of an ongoing pandemic with severe impacts worldwide. The SARS-CoV-2 spike protein, which is primarily involved in viral infectivity, transmissibility, and antigenicity, is rapidly mutating. As mutations accumulate, Variants of Concern (VOCs) emerge, prolonging and increasing the pandemic’s severity. Throughout the pandemic, the COVID-19 Genomics UK consortium (COG-UK) has used SARS-CoV-2 sequence data to share details about VOCs with expert audiences via their Mutation Explorer (ME). It is also important for VOC information to be made highly accessible to a general audience, who lack expertise in molecular virology but whose daily lives will be directly influenced by mutations in the SARS-CoV-2 spike protein. In molecular biology education, visualisations and interactive applications have been shown to improve understanding of protein structure and function, and to boost engagement and active learning. Therefore, we used these methods to create the SARS-CoV-2 Spike Protein Mutation Explorer (SSPME), an educational, interactive visual resource for the COG-UK/ME. This application places the mutations characteristic of VOCs in the context needed by non-specialists, using an interactive spike protein 3D model, narrated animations depicting SARS-CoV-2 entry and neutralisation, and glossaries of relevant terms. User-testing, on participants recruited through social media, showed that compared to the specialist data presentation of COG-UK/ME, the SSPME offered substantially better usability, and significantly improved knowledge acquisition and confidence. Our results show that the SSPME provided an improved platform for communicating complex, topical information about SARS-CoV-2 spike protein mutations and VOCs to the wider public.

*<Link to SSPME:* [*https://sc2-application.itch.io/sars-cov-2-mutation-explorer*](https://sc2-application.itch.io/sars-cov-2-mutation-explorer)*>*