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Short communication

The Increasing role of health economics in the HTA of COVID19-vaccines

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The impact of COVID19 and vaccine implementation

As of May 2022, almost 6.5 million people died of COVID-19 globally (WHO). With the pandemic now ongoing for 2.5 years, it has typically gone through several stages, with its specific considerations. Notably and given the urgent situation in the first one-and-a-half years, health-economic aspects have not been prominent in Health Technology Assessment (HTA). Lockdowns have been installed against enormous – mostly unknown – societal costs, both concerning GDP as well as both physical and mental health. Notably, estimates have been made that countries' annual GDPs could have been affected by reductions up to 30% (Keogh-Brown et al., 2020). Subsequently, vaccines have been introduced without the general health-economic considerations that mostly apply; for example, reflected in reports of country-specific NITAGs (National Immunization Technological Advisory Groups). Notably, HTAs were focussed on efficacy, safety and delivery. With potentially unexpectedly high efficacy against severe disease, in particular, in western countries focus soon shifted to safety issues around thrombocytopenia and myocarditis as well as real-world data analyses for effectiveness.

Post-pandemic phase

Earlier this year, the emerging omikron-variant – potentially associated with less severe disease - might have precluded on new endemic/epidemic phases of the pandemic. While COVID19 vaccines were logically not immediately subject to health economics scrutiny, they will possibly be increasingly in later stages when boosters and revaccinations are considered in less-urgent situations, allowing more considerate recommendations, with potentially various brands from which to select, inclusive heterologous and homologous boosting. Notably, since the start of the COVID19 pandemic, similarities with the influenza virus, inclusive its - both seasonal and potential pandemic nature - have been sketched and influenza-like endemic/epidemic scenarios seem reasonable. In such scenarios, an increasing role for health economics in HTA of COVID19-vaccines can be expected. Considerations now eminent in COVID19-vaccines have been present for other potentially vaccine-preventable infections for decades upon which experiences can be drawn, inclusive economic impacts, specific cost-effectiveness methodologies, basic reproduction rate estimates, real-world data calibrations, discounting of long-term effects and transmission modelling (Boersma et al., 2020). Also, scarce health-economic COVID19 economic analyses already available can inform such more extensive sets of analyses.

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Cost-effectiveness of COVID19-vaccines

Already since the beginning of the pandemic, and even in the initial sheer absence of vaccines, interest has existed in the cost-effectiveness of COVID19-vaccines. An initial paper analyzing a hypothetical COVID19-vaccine for the US found cost-effectiveness at US$8200 in the base case, using a Markov cohort static model with a one-year time horizon and the health-care perspective (Kohli et al., 2021). Notably, a 60% vaccine effectiveness against disease was used, as we now know reflecting a conservative assumption in the first months. More in line with modelling traditions in infectious diseases, next work applied dynamic transmission-dynamic models, explicitly considering the transmission of the virus in the population. Ergo, next to vaccine effectiveness on disease, also vaccine effectiveness against transmission plays an important role. For example, early 2021 Hagens et al reported cost-effectiveness of COVID19 vaccination in Turkey taking both the societal perspective with disease-related production losses and transmission dynamics into account (Hagens et al., 2021). Also, in that study favourable cost-effectiveness for vaccination was found at either low cost-effectiveness ratios or even rendering cost savings. Given the inclusion of the transmission dynamics, next to effectiveness on diseases also effectiveness on transmission was taken into the model; ergo, next to reducing the likelihood for serious disease, also the vaccination was assumed to reduce the likelihood of transmitting the virus if vaccinated. In line with later published real-world findings (Hall, 2021), it was assumed that effectiveness on transmission would be approximately half of that on disease (notably, 45 and 90%, respectively).

Implications for further discussion

Further work seems now concentrating on explicitly considering the potential novel context where COVID19 becomes endemic and will follow an influenza-like seasonal – partly predictable – pattern. This typically comes with some aspects well-known from influenza modelling (Postma and Chhatwal, 2022), such as reducing the time horizon to the 6-month winter season and relaxed non-pharmaceutical interventions (social distancing and face masks). In an analysis for Denmark (Debrabant et al,. 2021), a dynamic modelling approach was followed and continued limited social distancing and use of face masks still assumed. Both healthcare and societal perspectives were used and favourable cost-effectiveness was being identified. From the healthcare perspective, it was found that any strategy including older adults ≥60 appeared more cost-effective than strategies targeting populations <60. Inclusion of production losses in the societal perspective actually rendered strategies targeting those <60 cost-effective as well, in particular if current relatively modest vaccine prices would also be in force in endemic situations.

With cost-effectiveness issues likely getting more prominent in discussions on COVID19 vaccinations in an endemic context, the general discussion on broader impacts of vaccines will also apply (Postma et al., 2022). In particular, in the context of that discussion it is argued that for vaccines a broader view on values is needed to adequately justifying the specifics that vaccines pose. Notably, in this respect health and productivity effects for caregivers, distributive effects have been specifically mentioned, as well as providing piece of mind by reducing fears of infection, consequences of long-term complaints after COVID19 infection, macro-economic impacts and limiting capacity strains in hospitals. Some of these broader impacts have certainly been further attenuated by the COVID19 pandemic, illustrating the urgent need to take these on board in health economics of vaccines; and this not only for COVID19, but also for other vaccines. For example, hospital capacity problems with COVID19 can be exemplar for influenza and fear of COVID-infection exemplar for e.g. meningococcal B infection.

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