

# COVID-19 vaccines in the Real World

Assessing clinically relevant outcomes in populations not included in clinical trials will provide vital data on the effectiveness of the vaccine doses

**V**accines against the SARS-COV-2 virus received emergency use approval based on short-term efficacy against symptomatic COVID-19 in clinical trials. But these trials did not provide data on efficacy against severe disease, hospitalisation, or mortality. Efficacy assessment of such endpoints would require the inclusion of > 180,000 young or >10,000 elderly subjects. Recruitment of such a large number of participants in vaccine trials is challenging. Hence, post-approval, real-world studies are necessary to generate evidence of vaccine effectiveness against clinically important endpoints, especially in populations not included in clinical trials, such as elderly people with comorbidities.

Real-world studies of effectiveness can provide evidence of 1) the direct protective effect of the vaccine at the individual level and 2) the real-life impact of vaccination programmes at a population level. Balicer *et al* evaluated the effectiveness of the mRNA vaccine in a large population of insured Israeli citizens - 596,618 vaccinated and 596,618 unvaccinated. Both the populations were matched for covariates, e.g. demography and comorbidities to remove the impact of such confounding covariates on the vaccine effectiveness. mRNA vaccine showed a reduction of 92% in infections and severe disease, 94% in symptomatic illness, 87% in hospitalisation, and 84% in mortality. Effectiveness of vaccine in reducing infection and illness was high amongst subgroups: elderly > 70yrs 95-98%, 3 or more comorbidities 86-89%, type 2 diabetes mellitus 91%. Segal *et al* conducted retrospective analysis of data of 3,425,684 vaccinated and 684,694 PCR positive Israeli citizens. This study showed changes in dynamics of the pandemic, including a larger and earlier decrease in

cases and hospitalisations among vaccinated older individuals. In individuals 60 years and above, there was a decrease of 49% in cases, 36% in hospitalisations, and 29% in severe hospitalisations compared to peak levels. Also in cities vaccinated early, a decrease of 60% in cases and 37% in severe hospitalisation. The study accounted for potential factors such as lockdowns which might have influenced the decline in clinical outcomes.

Israel's success in a quick study of real-world effectiveness of COVID-19 vaccines is rooted in 1) universal health insurance coverage 2) early adoption of electronic medical records 3) good long-term follow-up of patients 4) Ministry of Health transferring centrally-collected COVID-19 related data to health insurances daily and 5) efficient integration of background longitudinal medical information with real-time vaccination status and all COVID-19 related outcomes for the entire insured patient population.

The Indian government's massive vaccination effort provides a unique opportunity to study real-world effectiveness for Covishield and Covaxin. Health information on vaccinees — demography, comorbidity etc — is available in a centrally registered database. A real-world study amongst vaccinated and unvaccinated health care workers would provide vital data on effectiveness, hospitalisation, severe disease, mortality and transmission in high-risk populations. Assessing clinically relevant outcomes in populations not included in clinical trials — e.g. >= 60 years, and >= 45 years with comorbidities — would provide useful data on the effectiveness of 1 and 2 vaccine doses.

High-quality real-world effectiveness conducted rapidly would also address vaccine hesitancy and boost confidence in Indian vaccines. ■



DR ARUN BHATT

Writer is a consultant on clinical research & development from Mumbai.

arun\_dbhatt@hotmail.com