PHE Vaccine Surveillance Strategy – BMA summary

Public Health England has published their vaccine surveillance strategy in tandem with the Government's vaccine delivery plan, this is their blueprint on monitoring the delivery and the real world impact on health the COVID-19 vaccine.

PHE will monitor vaccine effectiveness at preventing both symptomatic and severe disease and at reducing infection and transmissibility. This will be accounted for across multiple different sub-groups including age (and other clinical risk factors), viral variants, number of doses administered, timing of doses, and the comparative effectiveness of different vaccines in the real world.

PHE will use a number of different data sets to make its assessments. It will be measuring effectiveness using several different outcomes.

- Virologically confirmed symptomatic disease using PCR
- Hospitalisation
- Mortality
- Laboratory confirmed infection (symptomatic or asymptomatic) using PCR or by demonstrating seroconversion due to disease
- Markers of infectiousness and transmissibility - viral load (CT value) and culturable virus
- Onwards person to person transmission

Symptomatic Disease

PHE will use routine testing data from pillar 1 + 2 which will be linked to vaccination data from the National Immunisation Management System (NIMS), this will provide PHE with a large data set for rapid analysis of effectiveness against symptomatic disease. Once the vaccination rollout is implemented, if any cases are picked up by routine testing PHE will begin enhanced surveillance, with clinical questionnaires done by the individual and their GP and a variety of tests used to confirm infection, immune response and viral load. They will also use GP data in partnership with the RCGP using their already established networks for assessing the efficacy of influenza vaccines

Severe Disease

Hospitalisation data provides a robust metric for how well the vaccine is preventing severe disease, hospitalised patients are reported daily to PHE and this will be linked to NIMS. Vaccine uptake can be then be measures in hospitalised cases vs general population.

Equally vaccine data will be linked to NHS and ONS mortality data to see the effect the vaccine is having on reducing mortality.

Infection

The clinical trials gave us good data around the vaccine's ability to prevent severe disease but was not designed to assess the vaccine's ability to prevent infection. This alongside transmission will be the major features PHE will be looking to gather novel data on.

To do this PHE will use a number of studies that have been operating since the start of the pandemic to asses asymptomatic infection. The SIREN study of 40,000 healthcare workers will provide a useful data set given that this is an established study and healthcare workers are one of the first groups to be offered the vaccine. This is a similar situation with the Vivaldi study conducted by UCL with uses regular PCR tests among social care residents and staff to check for asymptomatic infection. Later in the vaccine rollout PHE will also use the ONS community infection data, this will provide a longer-term data set. Lastly routine data sources such as the RCGP and GP databases will also be used.

Transmission

Measuring the vaccine's effectiveness at preventing onward transmission will be a crucial factor in policy decisions around loosening restrictions. In order to assess this PHE will be building on their existing PHE household contact survey and using a selection of individuals identified throughout Vivaldi and through the SIREN study. Chosen participants, their households and contacts are then sent questionnaires and are given throat and nose swabs at regular intervals. This will identify cases which can then be measures against whether the initial participant was vaccinated or not.

Reporting

PHE stated that the earliest estimates of efficacy will be reported in the first quarter of 2021. Effectiveness monitoring will being once eligible cohorts have received the full course and mounted an immune response (7 days after the second dose) and effectiveness of a single will be monitored from 14 days after the first dose. There are obvious caveats including disease epidemiology and sample size, and this may mean that relative effectiveness of different vaccines and different dosage schedules may be estimated.