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2021 Infection Prevention & Control for General Practice

July 2021 e – newsletter # 6 – COVID-19 immunisation – three main points to educate on

Part 1 - Herd immunity (table ref Prof Raina Macintyre utube late 2021)

The term and concept of "Herd Immunity" arose from vaccination programs - it can be achieved through:

- Mass vaccination - hybrid of what we are doing with targeted vaccination
- Targeted vaccination e.g quarantine and healthcare staff)
- Ring vaccination such as during an outbreak (least preferred but can act as PEP during an outbreak)

Table 1 - Vaccine coverage required for herd immunity by varying vaccine efficacy against all infection

Herd immunity cannot be achieved with vaccine efficacy less than 70%

Vaccine Effectiveness (over70% is the aim)	Population vaccine coverage required for herd Immunity
95%	63%
90%	66%
80%	75%
70%	86%
60%	100%
50%	Not achievable

Part 2 – The 4 main types of vaccines, how they work and where do the familiar names fit

4 basic technologies

1. Viral vector e.g. Astra Zeneca uses a Chimp adenovirus to deliver to the host cell the code for making spike protein which elicits immune response both neutralising antibodies and T cells (virus is incapable of replicating)
2. Nucleic acid e.g. mRNA e.g Pfizer – mRNA gives host cell the genetic code to make spike protein which elicits an immune response
3. Protein subunit e.g novovax i.e. inject spike protein which elicits immune response
4. Whole virion (all except one are inactivated) e.g. Valneva (French vaccine) – may be considered less antigenic

Part 3 – How the current vaccines hold up against the alpha (UK variant) i.e is there any immune breakthrough?

From the MJA preprint May 2021

Based on post-vaccination self-reports of infections and after adjustment for age sex obesity and co-morbidities they estimated effectiveness rates of 60 to 70% beyond 21 days after administration of either (AZ or Pfizer) vaccine.

Late June 2021 from Tim Spectre King's College London Prof of Genetic epidemiol and co-ordinator of the Zoe project

Vaccine reduces severity but symptoms are altered in the vaccinated i.e. headaches, runny nose, sore throat, cough – (fever 5th and breathlessness even lower). Those vaccinated but with co-morbidities / living in deprived areas get sicker.

Is it safe to mix and match or could this exacerbate infection by causing antibody dependent enhancement? This is what the data recently shows "A University of Oxford study, called Com-COV, has said alternating vaccines where a shot of Pfizer's Covid-19 vaccine is given four weeks after an AstraZeneca shot will produce better immune responses than giving another dose of AstraZeneca". The study, published on the Lancet pre-print server, says "mixed" doses of these vaccines induced high concentrations of antibodies against the SARS-CoV2 spike IgG protein when they were given four weeks apart. (The initial "prime" vaccination with the follow-up "booster" vaccination). **However, follow current advice.**

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