

Solutions

2.1

- IgG ✓.

2.2

- $1 - 1/4 = 75\%$ ✓.

2.3

- Dose 1 primes, 2 boosts, 3 matures affinity and catches slow responders ✓.

3.1

- Day 5: early primary – IgM first ✓. Day 16: seroconversion with class switch ✓.
- Primary curve: IgM within days, IgG rising to peak 7–14, titre modest; the fourfold IgG rise dates the response.
- Stable IgG alone: past infection or vaccination (no rise, no IgM).

3.2

- Threshold herd $\approx 1 - 1/12$ to $1 - 1/18 = 92\text{--}95\%$ immune; at 84% coverage susceptible $\approx 16\% > 5\text{--}8\%$ ✓.
- With R_0 12–18 each case infects >12 susceptibles: sustained transmission resumes.
- Restore $\geq 92\text{--}95\%$; influenza ($R_0 \approx 1.3$) needs only $\sim 25\%$, so its policy targets the vulnerable rather than transmission alone.