vaccines to protect everyone

the immune system is very big & complex...
there are lots of different points at which things can go wrong & lots of different reasons why someone's immune system might not function in the way you would expect it to...

Some people born with immune errors

people being treated for cancer

some medications influence the immune system

pre-existing diseases

Ageing is a massive factor
As we get older the immune system changes
very specific set of B cells that are associated with age

Obesity causes immune system to be switched on all the time, rather than when encountering a specific antigen
→ proportions of antibodies can be slightly different - might effect how they are responding to disease & vaccination

how can we increase the protection that the vaccine provides for these groups?

we work with patient groups & look at their...
...responses. look at different parts of their immune system.

innate responses
B cell responses
T cell responses
and see which parts of their response is not working well.

B cells can fall into 2 main categories
→ memory B cells
→ Plasma cells

I work primarily in B cells in the adaptive immune system & vaccination in people with errors in their immunity

Your adaptive immune system gives you your long-term protection, & this is what's relevant when it comes to vaccination

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vaccines work by introducing an immune challenge (can be done in lots of different forms)

when you innoculate with a vaccine, vaccines have 2 main components

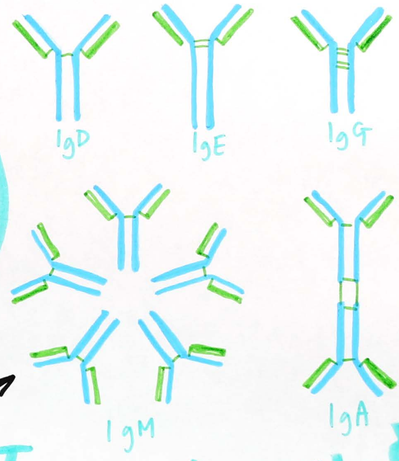
Antigen
when you first encounter an antigen, a lot of these antibodies will be released

Adjuvant
(a chemical or something that stimulates the immune system

vaccines can be designed with a number of different adjuvants & these stimulate different parts of the immune system differently

1. so one way you can optimise vaccines for people is to pick your adjuvant so that it stimulates correct part of the immune system

2. Some people with issues in immunity may have a decling response to vaccines compared to a healthy individual - look into vaccinating more often



Types of Antibodies

can be useful in stopping a pathogen from entering a cell

if a baby is premature can that affect the immune system?

the main areas that produce immune cells are thymus, bone marrow & spleen, if a baby is born before these organs are fully matured, I would imagine they'd have issues