



## Optimmunize 2022

### Pre-conference statement

It is now clear that vaccines can affect the immune system beyond the induction of specific immunity (specific antibody, and B and T-memory cells), with profound implications for overall health.

Vaccines can (among others)

- induce epigenetic modifications of innate immune cells, enhancing or reducing the innate responses to many different pathogens
- lead to emergency granulopoiesis that releases neutrophils in larger numbers with direct implications for ongoing/subsequent infections with non-vaccine pathogens
- induce cross-protective T-cells that can respond to pathogens unrelated to the vaccine pathogen

Epidemiological studies have shown that vaccines affect the risk of *overall* mortality and morbidity much more than would be anticipated based on their target: e.g. some vaccines have been shown to have marked mortality reducing effects even in the absence of the vaccine-specific pathogen. These effects are termed “non-specific effects (NSEs).” They are often sex-differential.

Public health wise, the non-specific effects may be very profound: e.g. BCG vaccination has been associated with more than a third reduction of neonatal mortality. However, these NSEs have not always been consistent across settings and time: e.g. the NSEs of BCG vaccination are reduced when a diphtheria-tetanus-pertussis vaccine is given afterwards. This is related to the fact that in contrast to the vaccine-specific effects, NSEs are context-specific. Other factors affecting the immune system can affect the magnitude and sometimes even the direction of the NSEs. Thus, the chronology of administration and combinations of vaccines are important considerations.

At the Optimmunize 2022 conference, the aims are to:

- Present the latest research into non-specific and sex-differential effects of vaccines.
- Discuss what further epidemiological evidence is needed for policy changes for existing vaccines, including which further studies are needed to identify which factors may modify the effects
- Discuss what further immunological evidence is needed to better understand the immunology underlying NSEs of vaccines, including which factors may modify the effects
- Discuss who should do such additional studies – should WHO/national vaccine programs/other stakeholders be involved?
- Discuss if some findings are compelling enough to lead to immediate policy changes: e.g. BCG vaccine at birth has been associated with marked reductions in neonatal morbidity and mortality in Africa and the biological mechanisms have been identified – should this lead to a change in the indications for BCG vaccination in Africa?

The conference will consist of individual presentations and panel discussions.

Following conclusion of the conference, a conference statement will be published.