

# What complementary vaccine delivery strategies should be considered (in which context)?

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# The fundamental question

The goal of any vaccine sparing campaign is to use vaccine in a targeted way identifying people or communities who when vaccinated maximally reduce disease spread. What research is needed to guide this approach?

# What we are facing

- Global rollout of vaccine is several orders of magnitude too slow, inequitable and underestimates intra-country distribution, last mile challenges
  - Vulnerable people on most of the planet are not being protected
  - Viral transmission and evolution is outpacing control measures
    - *Even worse, slow vaccine rollout could be enabling faster transmission and evolution of the virus*
- We need to develop/coordinate disease detection and vaccination delivery systems based on epidemiology that protects the vulnerable and limits viral transmission

# Experience of smallpox eradication

- “Ring vaccination” is misleading misnomer—the campaign was based far more on disease detection, coupled with quarantine/isolation and targeted vaccination
  - dozens of complimentary surveillance/detection systems
  - common database management system
  - used to determine distributed vaccine production, surge vaccine to high risk areas, interrupt chains of transmission

# Can lessons from smallpox, polio, and Ebola help with COVID-19?

- A 21st century version of “surveillance and containment” can help guide research agenda to challenge ideas about surveillance of asymptomatics, digital disease detection, participatory surveillance and a coordinated global approach to guide scarce vaccine where it will do the most good to fight COVID-19.

# 21st cent surveillance systems to track transmission and help target interventions

- Sewage sampling
- Exposure notification
- Participatory surveillance
- Digital syndromic surveillance
- Media scrubbers
- Combined ILI monitoring/COVID surveillance
- Digital systems coupled with government reporting
- Social media searches
- Coordination of private sector tech systems
- Others

# Viral surveillance systems to track transmission and help target interventions

- Many of the above listed approaches are done individually, or sometimes in limited combinations
- They need to be coordinated under one system
- In addition, we need verification and viral sequencing carried out systematically, with stochastic sampling as well
- All these systems need to operate in real time

# Need research to determine alternatives and supplements to mass vaccination

- New variants with high  $R_0$  and effective  $R$ 's make herd immunity an unobtainable challenging premise
- Mass vaccination alone has rarely been sufficient in global disease control
- Insufficient inequitable vaccine rollout
- Underestimate of last mile challenges
- Needs to be locally/regionally produced
- Vaccine distribution should be guided by epidemiology not availability bias
- Viral mutation and variant production may happen anywhere



# Thank you