

How prepared are we for the next pandemic?

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WHO Collaborating Centre
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- Surveillance
 - Human disease
 - Animal human interface
- Interactions with agricultural sector
- Assessment of pandemic potential
- Diagnostic assays
- Access to antiviral drugs and antibiotics
- Vaccines
 - Goal
 - Who?
 - Which?
 - When?
 - Adverse events

3 Options for Pandemic Influenza Vaccines



Option A

Option B

Option C

Conventional
Approach

Enhance the
breadth of cross
reactivity

The 'game changer'
Approach

Strain Specific
Vaccines

Subtype Specific
Vaccines

Universal Vaccine

- **Principle:** Elicit strain-specific immunity
- **Goal:**
 - Prepare a library of Candidate Vaccine Viruses (CVVs)
 - Encourage vaccine manufacturers to develop experience working with CVVs
- **Process:**
 - Monitor genetic and antigenic drift in nature through surveillance
 - Determine when antibody elicited against previous CVVs fail to cross-react with drift variants
 - Prepare a new CVV
- **Caveat:**
 - Clinical trials are largely supported by the US government

- **Principle:** Elicit broadly cross-reactive subtype-specific immunity
- **Goal:**
 - Enhance the cross-reactivity of the Ab response
- **Processes:**
 - Oil-in-water adjuvants
 - Whole virion vaccines
 - Combine vaccine platforms
 - Select different viruses for development of CVVs
 - Select among existing influenza viruses
 - Select antigenically advanced variants (Kawaoka/Smith/Barr/Fox)
 - An ancestral/computationally optimized broadly reactive HA
 - Multivalent vaccine e.g. VLPs expressing different HAs
 - Combinations of antigens e.g. NP + M1 ± HA or T cell epitope vaccine + HA

Targets

- Hemagglutinin
 - Head
 - Stem
- Neuraminidase
- M2
- NP + M1
- T cell based protection