VACCINES
AN INFOGRAPHIC BREAKDOWN

WHAT IS A VACCINE?
A vaccine is a biological agent that induces an immune response against a target antigen from an infectious disease-causing pathogen. It must be:

<table>
<thead>
<tr>
<th>SAFE</th>
<th>SPECIFIC</th>
<th>STRONG</th>
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<tbody>
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<td>A vaccine must not give the patient new health complications.</td>
<td>Vaccines allow the induction of a highly targeted response.</td>
<td>Patients are provided with robust and long-lasting immunity.</td>
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WHAT IS VACCINE DEVELOPMENT LIKE?
From bench to bedside, the entire process may take multiple years. Shortening the development time often comes at the expense of patient safety.

**RESEARCH**
- **Step I:** Understand novel virus structure, route of infection, and life-cycle.
- **Step II:** Develop potential vaccines that will induce immunity against specific parts of the virus.

**PRE-CLINICAL**
Assess toxicity and efficacy of the vaccine in different animal models.

**CLINICAL**
- **Phase I:** Small scale; administered to healthy adults to assess safety and possible adverse effects.
- **Phase II:** Mid-scale; assesses vaccine preparation, dosage, and optimal method of administration.
- **Phase III:** Large-scale; assesses safety, efficacy, and population-level effects.

WHAT DOES IT MEAN FOR COVID-19?
COVID-19 is a novel coronavirus, which means limited knowledge about how it causes disease.

**INSIGHT**

The current estimate that a COVID-19 vaccine will be available in **18 months** is a highly optimistic prediction.

**TIME**

It is possible that a rushed vaccine development plan may come at the expense of efficacy and patient safety.

**SAFETY**

Collaborative efforts of research scientists in both the public and private sector are promoting accelerated vaccine design and development.

**EFFORTS**

MEANWHILE, WHAT CAN WE DO?

- Being informed of COVID-19 specific research, preventative measures, and government policies
- Actively partaking in physical distancing, and increasing sanitation such as hand-washing to decrease infections.

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