



THE NIGERIAN ACADEMY OF SCIENCE
NAS COVID-19 WEBINAR SERIES

COVID-19 VACCINES:

TO TAKE OR NOT TO TAKE

COVID-19 IN NIGERIA

SAMPLES TESTED

Feb 27 2020	1
Apr 19 2021	1,870,915

CONFIRMED CASES

Feb 27 2020	1
Apr 19 2021	164,303

ACTIVE CASES

Feb 27 2020	1
Apr 19 2021	7,858

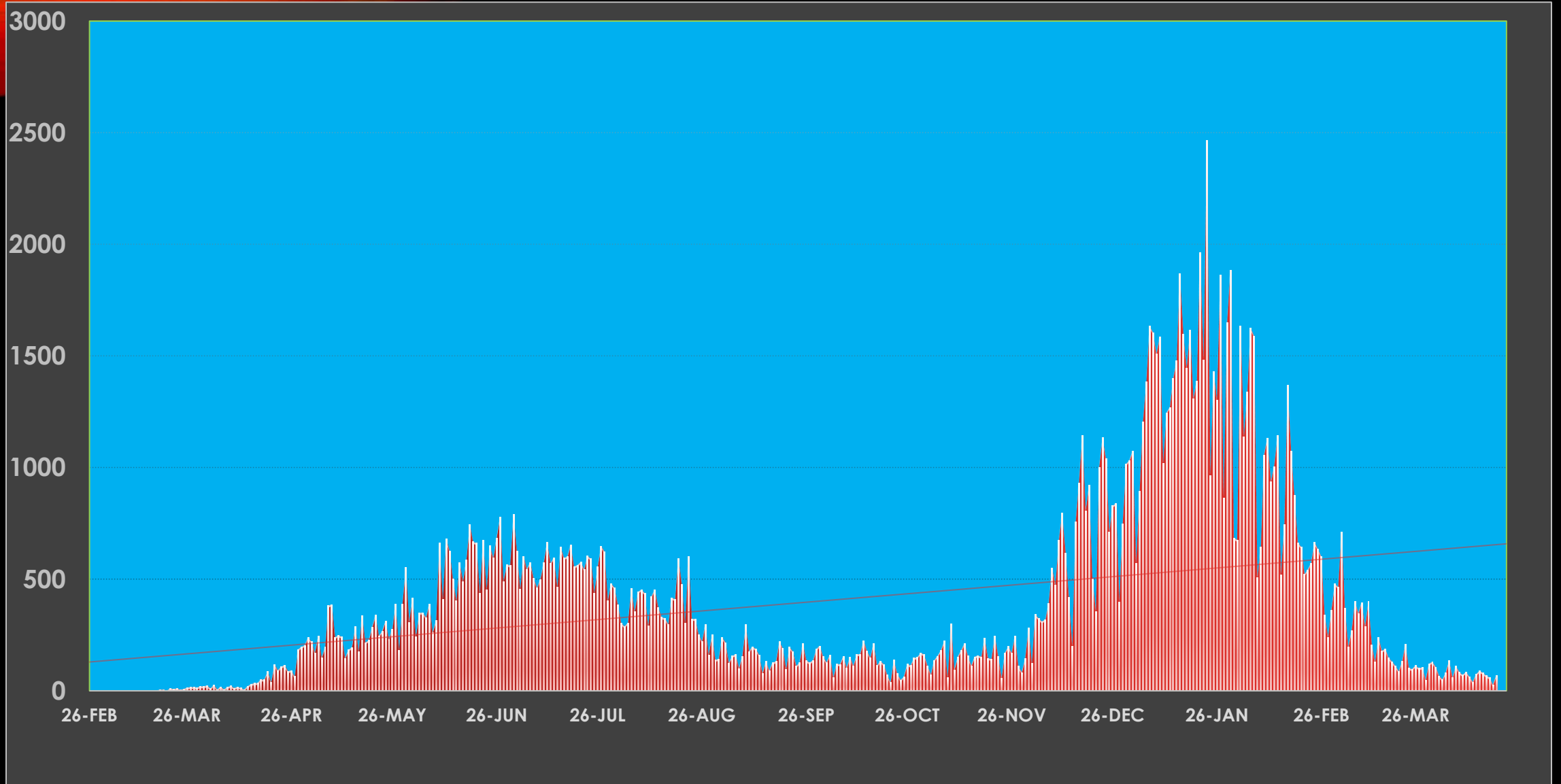
DISCHARGED CASES

Feb 27 2020	0
Apr. 19 2021	154,384

DEATHS

Feb 27 2020	0
Apr 19 2021	2,061

COVID19 CASES, NIGERIA 2020 -2021

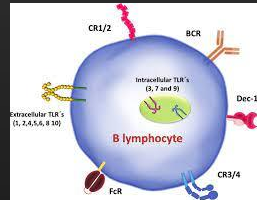
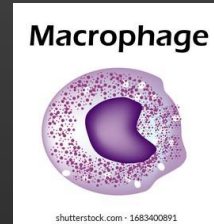


CASES AND DEATHS BY STATES TOP 5 & BOTTOM 5*

STATES	CASES	DEATHS (CFR%)
TOP 5		
LAGOS	58 146	439 (0.75)
FCT	19 747	165 (0.83)
PLATEAU	9 046	57 (0.63)
KADUNA	9 030	65 (0.72)
RIVERS	7 060	101(1.43)
BOTTOM 5		
KEBBI	450	16 (3.5)
CROSS RIVER	394	18 (4.6)
YOBE	371	9 (2.4)
ZAMFARA	240	8 (3.3)
KOGI	5	2 (40)

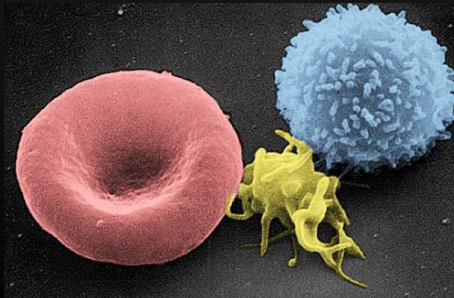
* As at 19 Apr. 2021

- **The Immune System—The Body's Defense Against Infection**



- **Macrophages** swallow up and digest germs and dead or dying cells, leave behind parts of the invading germs called antigens. The body identifies antigens as dangerous and stimulates antibodies to attack them.

- **B-lymphocytes** produce antibodies that attack the pieces of the virus left behind by the macrophages.



- **T-lymphocytes** are another type of defensive white blood cell. They attack cells in the body that have already been infected.

Types and forms of vaccines

- ✓ Most attenuated vaccines are viral, some are bacterial in nature.
- ✓ Provoke more durable immunological responses
- ✓ Attenuated vaccines:
 - ✓ capacity of transient growth
 - ✓ may revert to virulent form and cause disease,
 - ✓ but results in prolonged protection

WHAT ARE VACCINES?

Vaccines are antigens –

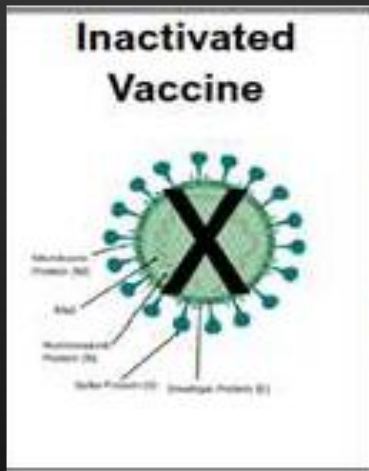
- **whole or fragments of a pathogen (virus, bacterium etc)**
- **which on exposure to the body, does not cause disease, but**
- **provokes the body to mount an immune response that**
- **can block or kill the pathogen if a person becomes infected or exposed at another time to the same pathogen.**

Types of vaccines

Toxoid - inactivated toxic compounds that cause illness rather than the micro-organism. Examples of toxoid-based vaccines include tetanus and diphtheria.

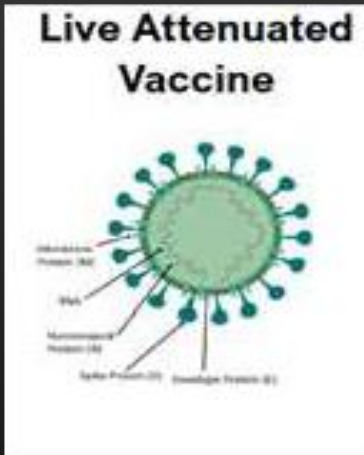
Conjugate vaccines

Conjugate - poorly immunogenic bacteria polysaccharide linked (conjugated) with proteins (e.g. toxins), *Haemophilus influenzae* type B vaccine.



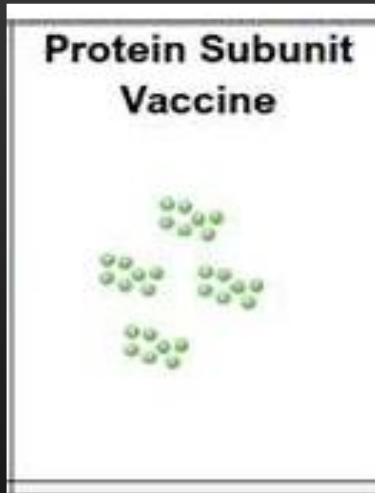
Inactivated or Killed -previously virulent, micro-organisms destroyed with chemicals, heat, radioactivity or antibiotics.

Examples - Hepatitis A, Rabies, Polio, Flu



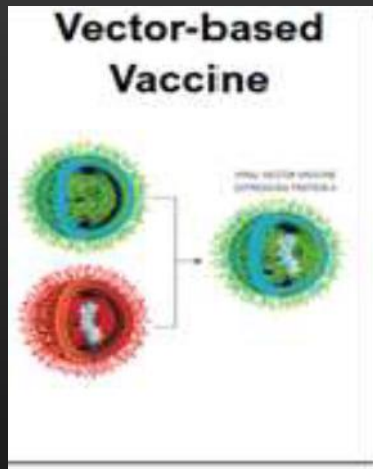
Attenuated - live, microorganisms. cultivated under conditions that disable their virulent properties, or which use closely related but less dangerous organisms to produce a broad immune response. **Examples – measles, mumps, rubella (MMR) rotavirus, smallpox, chickenpox and Yellow Fever**

Types of Vaccines



- Protein subunit vaccines
-
- harmless pieces (proteins) of the virus that cause COVID-19 instead of the entire germ.
-
- Post vaccination, immune system recognizes that the proteins as foreign body and begins making T-lymphocytes and antibodies.
-
- Future infection triggers , memory cells will recognize and fight the virus.
-

Types of Vaccines



- Vector-based vaccines
- contain a weakened version of a live virus—a different virus than the one that causes COVID-19—viral vector
- has genetic material from the virus that causes COVID-19 inserted in it (this is called a viral vector).
- Once the viral vector is inside our cells, the genetic material gives cells instructions to make a protein that is unique to the virus that causes COVID-19.
- Using these instructions, our cells make copies of the protein.
- This prompts our bodies to build T-lymphocytes and B-lymphocytes that will remember how to fight that virus if we are infected in the future.

Types of Vaccines



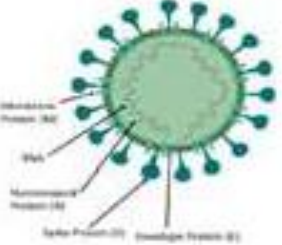
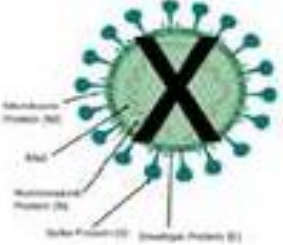
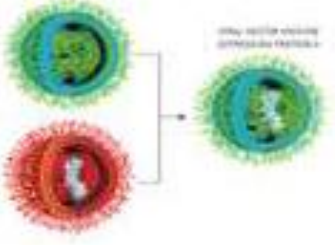
- mRNA vaccines
- contain material from the virus that causes COVID-19
- gives our cells instructions for how to make copies of harmless protein that is unique to the virus.
- cells then destroy the genetic material from the vaccine.; **does not get into the DNA.**
- Our bodies build T-lymphocytes and B-lymphocytes **MEMORY CELLS** that will remember how to fight the virus that causes COVID-19 if we are infected in the future.

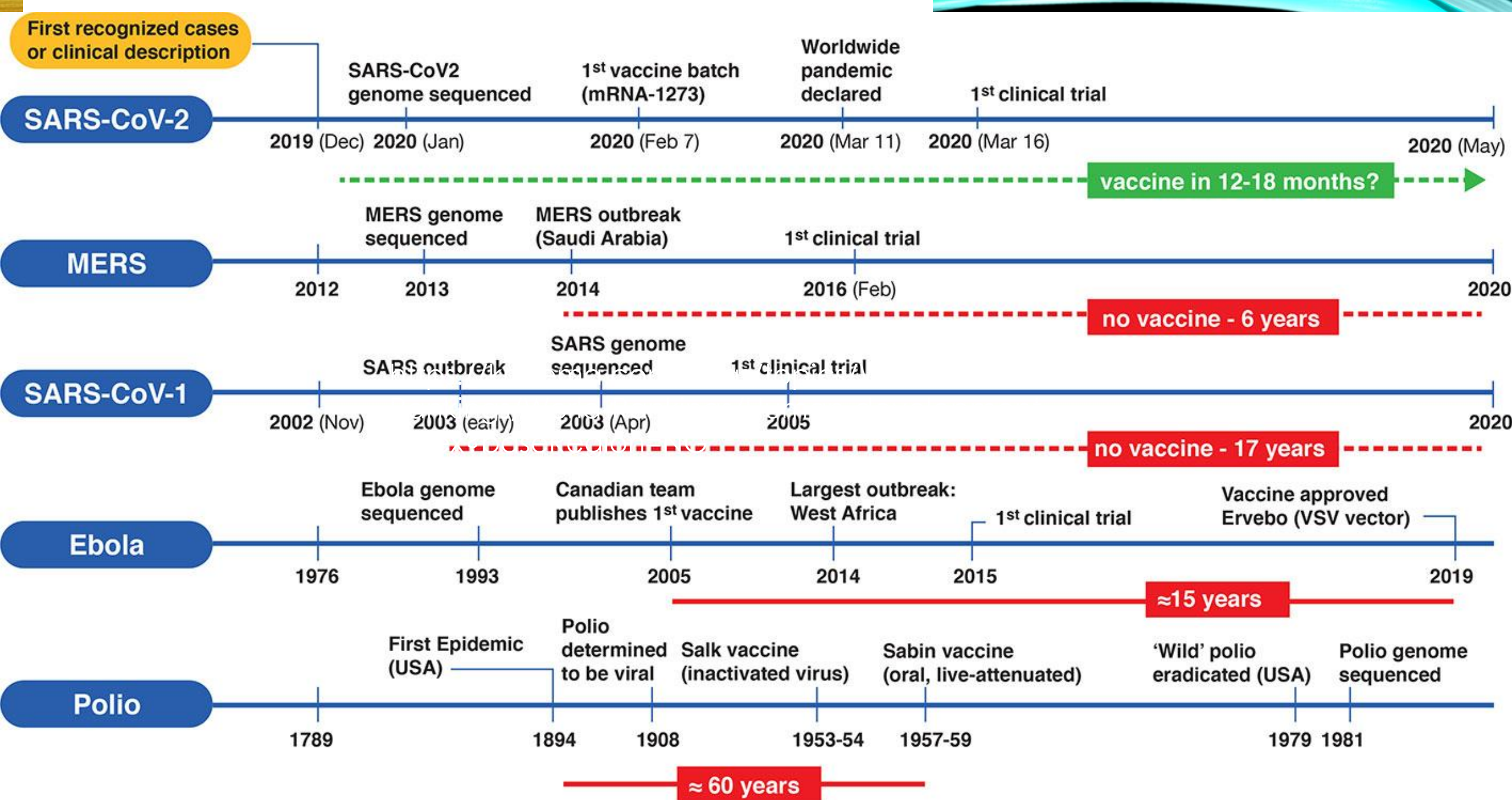
Types of Vaccines

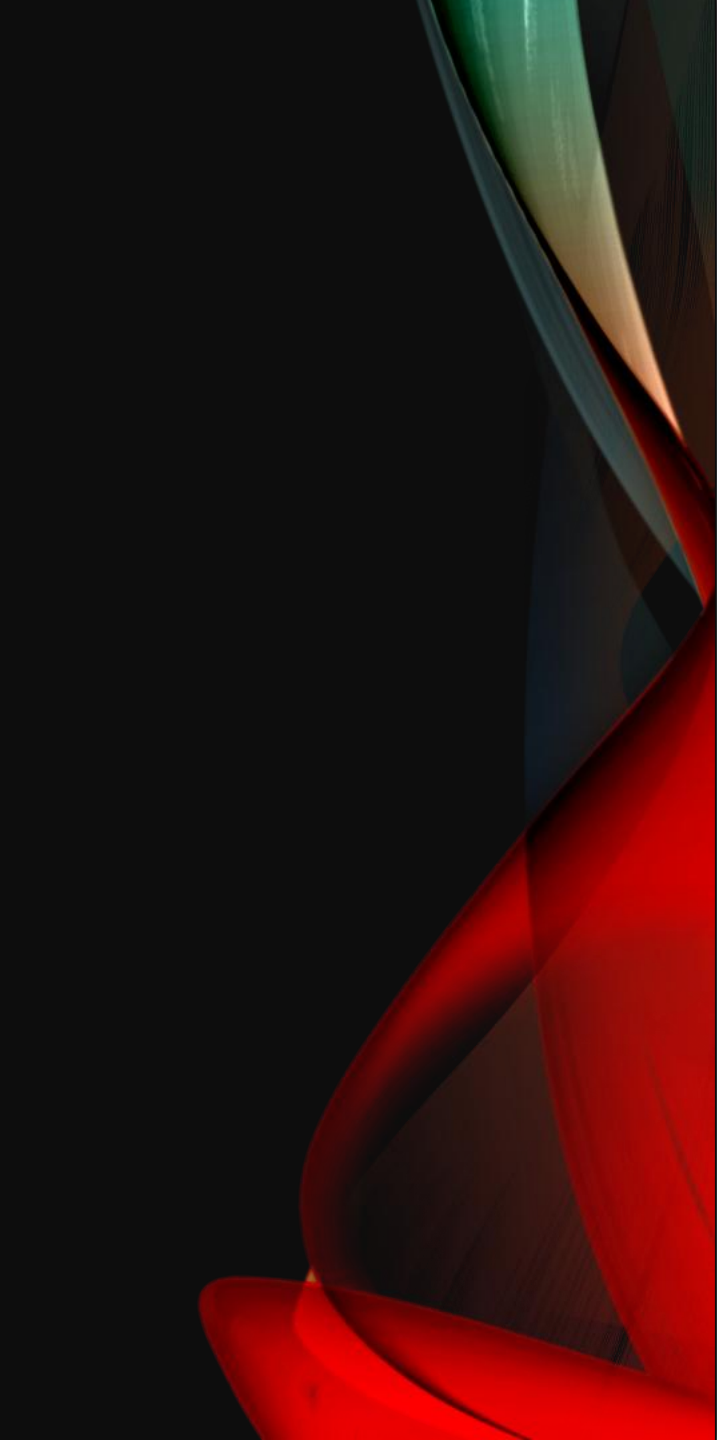


DNA vaccine

- A DNA vaccine uses a gene from a virus or bacteria to stimulate the immune system.
- Easy and inexpensive to manufacture.

	Live Attenuated Vaccine 	Inactivated Vaccine 	Vector-based Vaccine 	Protein Subunit Vaccine 	DNA Vaccine 	mRNA Vaccine 
PROS 	- Single dose can provide long lasting and effective immunity - Good immunity in oral dosing - No adjuvants needed - May have cross protection	Safer – no risk of recovering virulence and causing disease	- Innate immune response stimulation, T & B cell response induction - Versatility based on vector used	- Safer - Applicable to populations who are immuno-compromised / immunosenescent - Long-term immunity	- Stimulates both cellular & humoral immunity - No risk for virulence - Reversion - Reduced vaccine-related side effects - Temperature stable - Generally more stable compared to RNA	- Not infectious - No risk for genome integration
CONS 	- May recover virulence and cause disease - Horizontal spread of vaccine strain possible - Cold-chain sensitive - Transient immunosuppression	Short-lived immunity without adjuvants	Possibility of anti-vector immunity or pre-existing anti-vector immunity	- Low immunogenicity - Needs adjuvant - Needs multiple dosing for long-term protection	- Rare occurrences of activating oncogenes - Risk of eliciting anti-DNA antibodies - Need for adjuvants to induce high immunogenicity - Need for multiple doses	- Instability concern - Low immunogenicity



- 
- **How COVID-19 Vaccines Work**
 - COVID-19 vaccines help our bodies develop immunity to the virus that causes COVID-19 without us having to get the illness.
 - Different types of vaccines work in different ways to offer protection
 - Takes a few weeks for the body to produce T-lymphocytes and B-lymphocytes after vaccination during which one can still be infected
 - Sometimes after vaccination, the process of building immunity can cause symptoms, such as fever. These symptoms are normal and are a sign that the body is building immunity

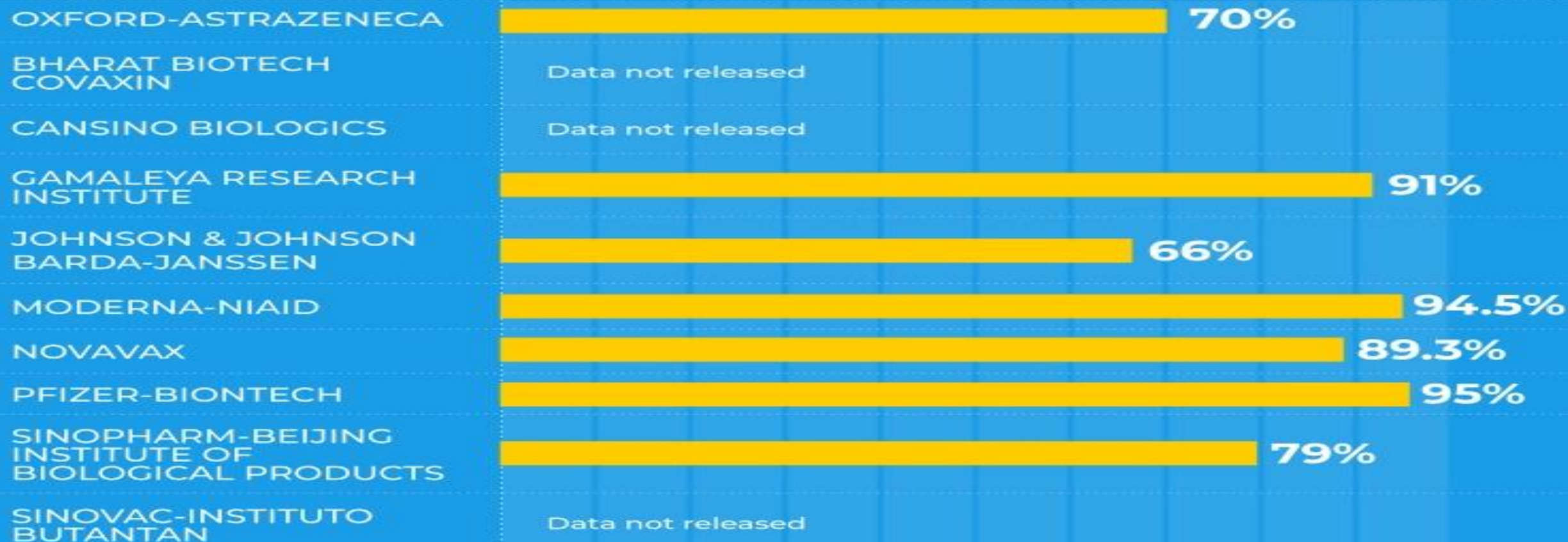


The efficacy or performance of the vaccine is dependent on a number of factors:

- *the disease itself
- *the strain of vaccine
- *keeping to vaccination schedule
- *other factors- species/age/genetic/predisposition

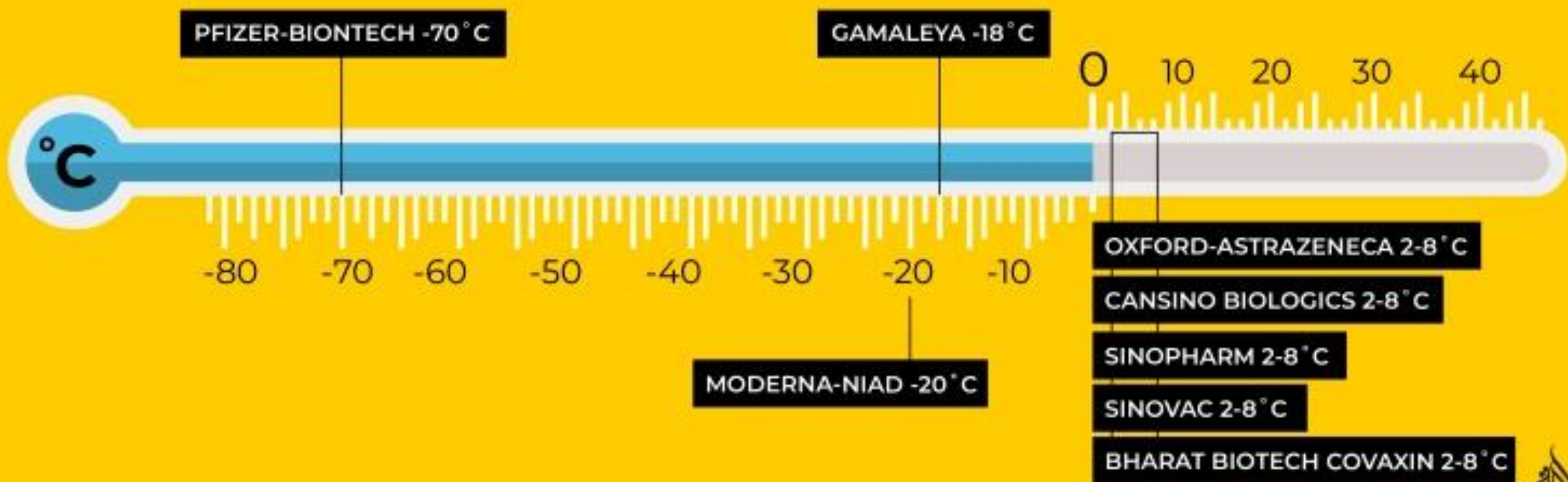
COVID-19

How efficacious is each vaccine?



COVID-19

What is the storage temperature required for each vaccine?



COVID-19

How many doses does each vaccine require?



OXFORD-ASTRAZENECA



MODERNA-NIAID



**BHARAT BIOTECH
COVAXIN**



PFIZER-BIONTECH



CANSINO BIOLOGICS



**SINOPHARM-BEIJING
INSTITUTE OF BIOLOGICAL
PRODUCTS**

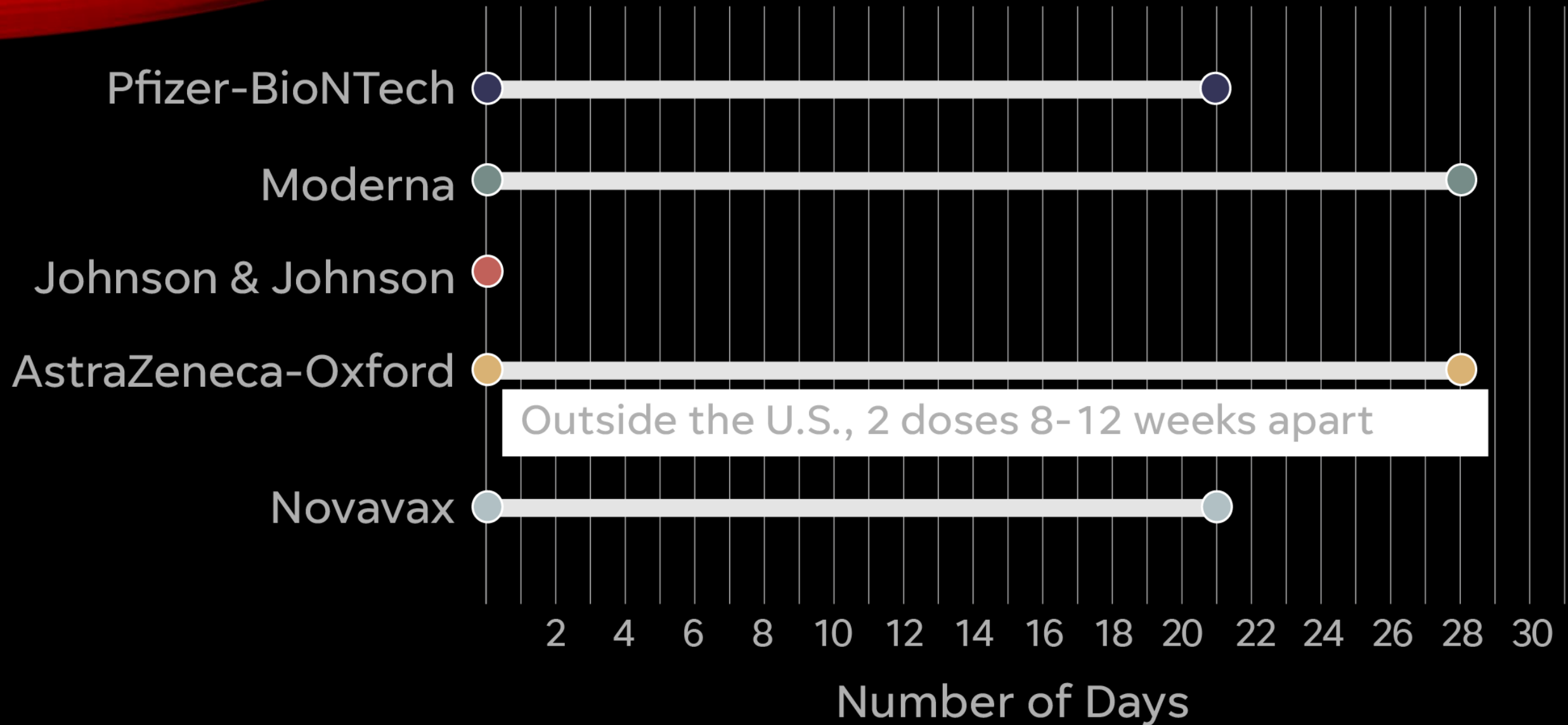


**GAMALEYA RESEARCH
INSTITUTE**



**SINOVAC-INSTITUTO
BUTANTAN**

○ Number of doses



A glass vial of Pfizer/BioNTech COVID-19 vaccine with a white cap and a white label. The label contains text including 'COVID-19 Vaccine', 'Two doses, 21 days apart', and '30 µg/dose'.

Company:

Pfizer/BioNTech

Vaccine Name:

BNT162b2

MOA:

mRNA vaccine

Dosing Schedule:

Two doses, 21 days apart
(30 µg/dose)

Efficacy:

95% at least 7 days
after dose 2

Doses Contracted by U.S:

300 million

A glass vial of Moderna mRNA-1273 vaccine with a white cap and a white label. The label contains text including 'COVID-19 Vaccine', 'Two doses, 28 days apart', and '100 µg/dose'.

Company:

Moderna

Vaccine Name:

mRNA-1273

MOA:

mRNA vaccine

Dosing Schedule:

Two doses, 28 days apart
(100 µg/dose)

Efficacy:

94.1% at least 14 days
after dose 2

Doses Contracted by U.S:

300 million

A glass vial of Johnson & Johnson/Janssen Ad26.COV2.S vaccine with a white cap and a white label. The label contains text including 'COVID-19 Vaccine', 'One dose', and '5d.0.5 ml'.

Company:

Johnson & Johnson/Janssen

Vaccine Name:

Ad26.COV2.S

MOA:

Adenovirus vector vaccine

Dosing Schedule:

One dose (two-dose regimen
under evaluation)

Efficacy:

72% in the U.S. and 66% globally
against moderate-to-severe
disease; 85% effective against
severe disease, 28 days after a
single dose

Doses Contracted by U.S:

100 million

How some of the different Covid-19 vaccines compare



Technology / company	Suitable for people with weak immune systems	Number of doses	Storage	Other vaccines using this technology
RNA Pfizer-BioNTech Moderna	✓		Pfizer-BioNTech: -70C and 2-8C for up to 5 days Moderna: -20C for 6 months and 2-8C for 30 days	No other licensed vaccines
Viral vector Oxford-AstraZeneca CanSino Biologics Gamaleya Research Institute Johnson & Johnson	✓ (Depending on viral vector used)	 to 	 2-8C	Ebola
'Whole' virus Sinovac (inactivated) Bharat Biotech (inactivated) Sinopharm (inactivated) Medicago Inc. (virus-like particle)	✓		 2-8C	Whooping cough (inactivated) Rabies (inactivated) Hepatitis A (inactivated) HPV/cervical cancer (virus-like particle)
Protein subunit Novavax Chinese Academy of Sciences	✓		 2-8C	Hepatitis B

COVID-19

Which vaccines are being used around the world?



OXFORD-ASTRAZENECA



MODERNA-NIAID



BHARAT BIOTECH COVAXIN



PFIZER-BIONTECH



CANSINO BIOLOGICS



**SINOPHARM-BEIJING INSTITUTE
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SIZING UP THE SHOTS

The Oxford University-AstraZeneca



TECHNOLOGY: Viral Vector (Genetically modified virus)
When injected, the vaccine instructs human cells to produce the SARS-CoV-2 spike protein — the immune system's main target in coronaviruses.
EFFICACY: 62-90%
PROCESS: Passed all three trials
MAJOR BUYERS: EU (400 million doses), US (300 million doses), UK (100 million doses)
THAILAND: 26 million doses
PRICE: US\$ 4 per dose
DOSED REQUIRED: 2

Pfizer-BioNTech



TECHNOLOGY: mRNA
The new mRNA technology tricks the body into making the viral protein itself which, in turn, triggers an immune response
EFFICACY: 95%
PROCESS: Passed all three trials
MAJOR BUYERS: EU countries (200 million doses), US (100 million doses)
PRICE: US\$20 per dose
DOSED REQUIRED: 2

Sinovac



TECHNOLOGY: Inactivated vaccine
Using the dead Covid-19 virus itself to trigger an immune response
EFFICACY: 50-70% (varies in tested countries)
PROCESS: Phase 3 trials
MAJOR BUYERS: Indonesia (40 million doses), Philippines (25 million doses)
THAILAND: 2 million doses
PRICE: US\$5 per dose
DOSED REQUIRED: 2

Sputnik V (by Russia's Gamaleya Institute)



TECHNOLOGY: Adenoviral vector-based platform
The technology delivers the genetic instructions for SARS-CoV-2 antigens directly into patients' cells, triggering an immune response
EFFICACY: 91.4%
PROCESS: Phase 3 trials ongoing
MAJOR BUYERS: Brazil (10 million doses), Argentina (10 million doses) Bolivia (2.6 million doses), India (contracted to locally produce 100 million doses)
PRICE: US\$10 per dose
DOSED REQUIRED: 2

Moderna

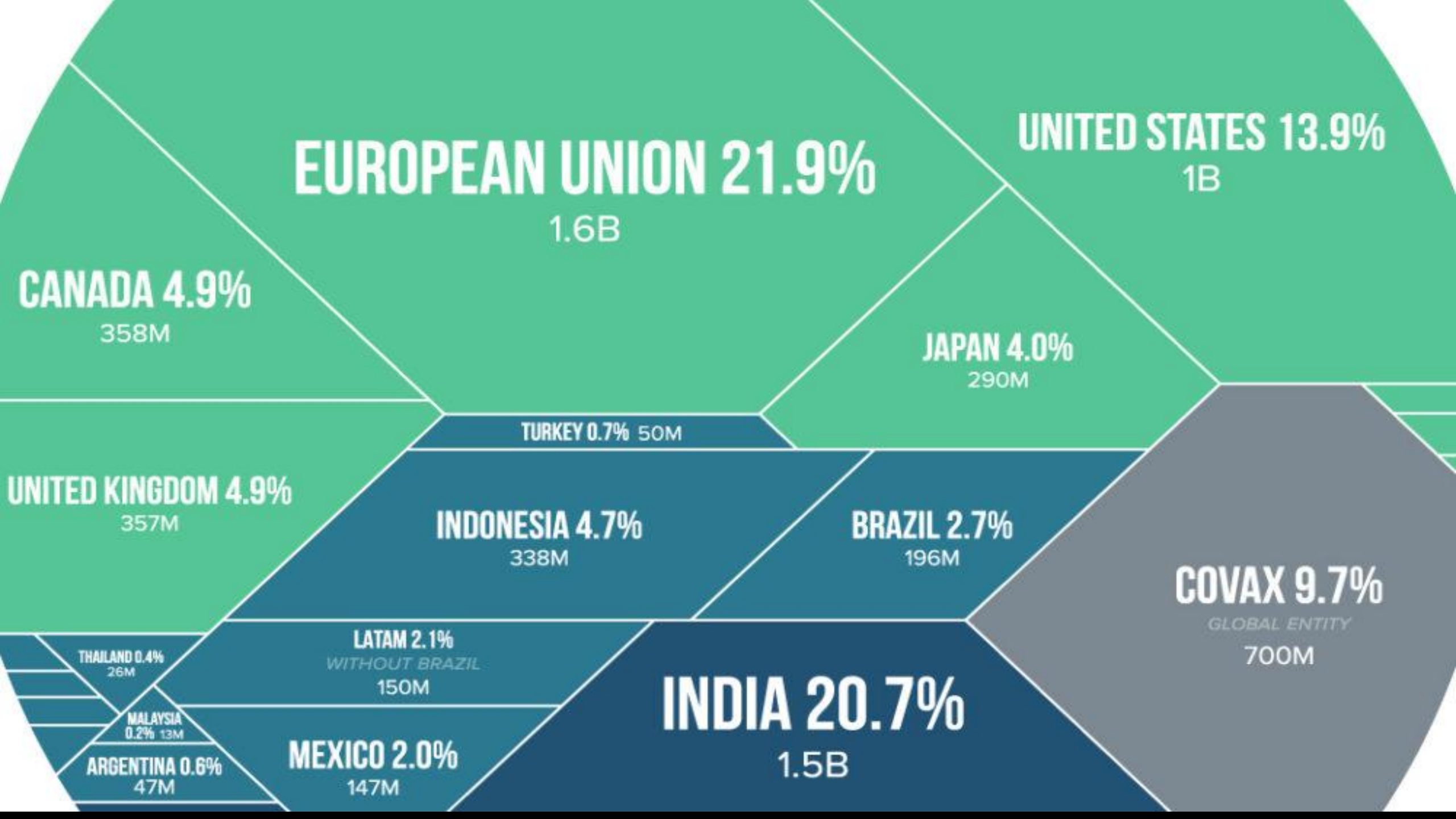


TECHNOLOGY: mRNA
A new type of vaccine which uses messenger RNA, which contains instructions for human cells to make proteins that mimic part of the coronavirus, to trigger an immune response.
EFFICACY: 95%
PROCESS: Passed all three trials
MAJOR BUYERS: EU (160 million doses), US (100 million doses), Canada (40 million doses)
PRICE: US\$33 per dose
DOSED REQUIRED: 2

Johnson & Johnson

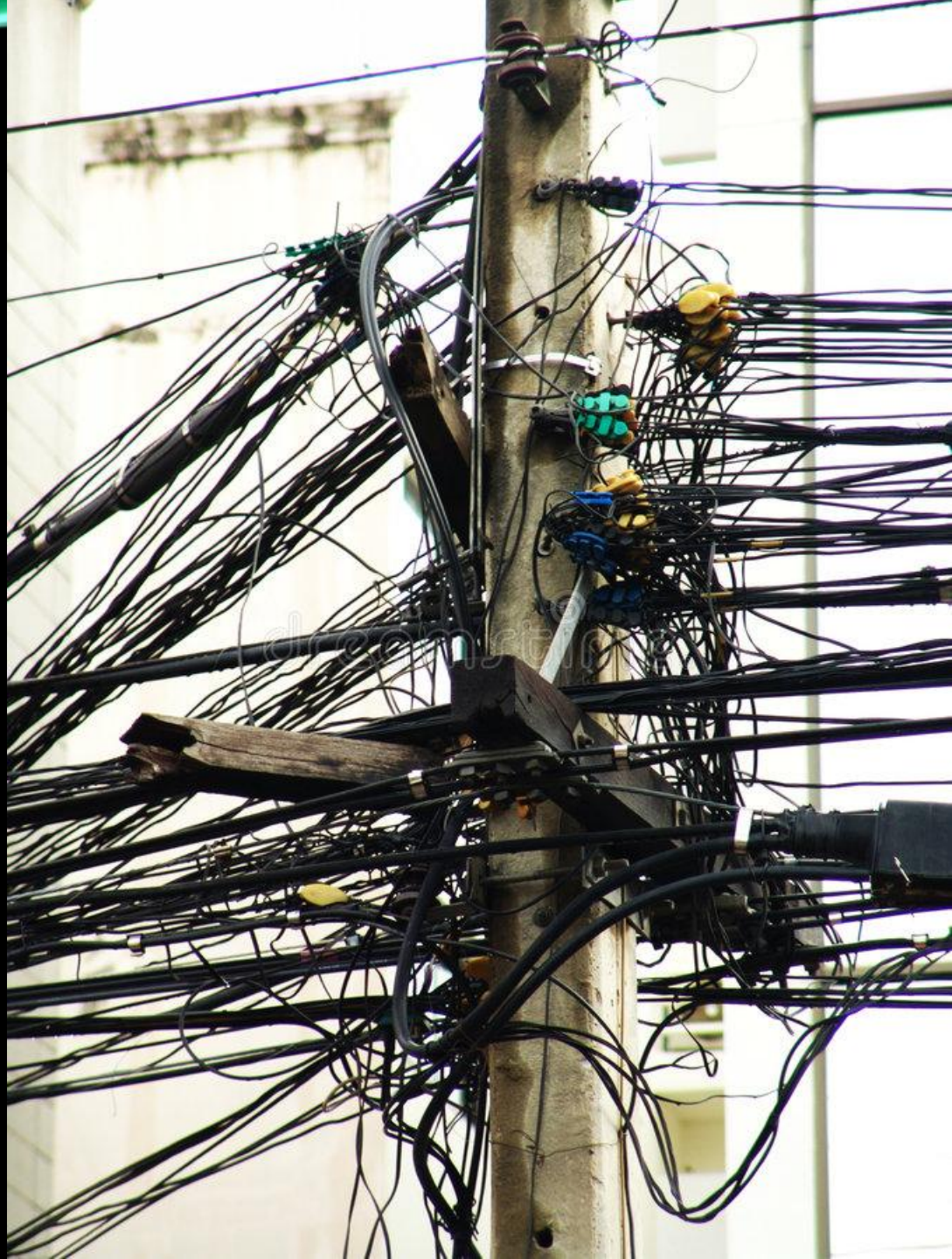


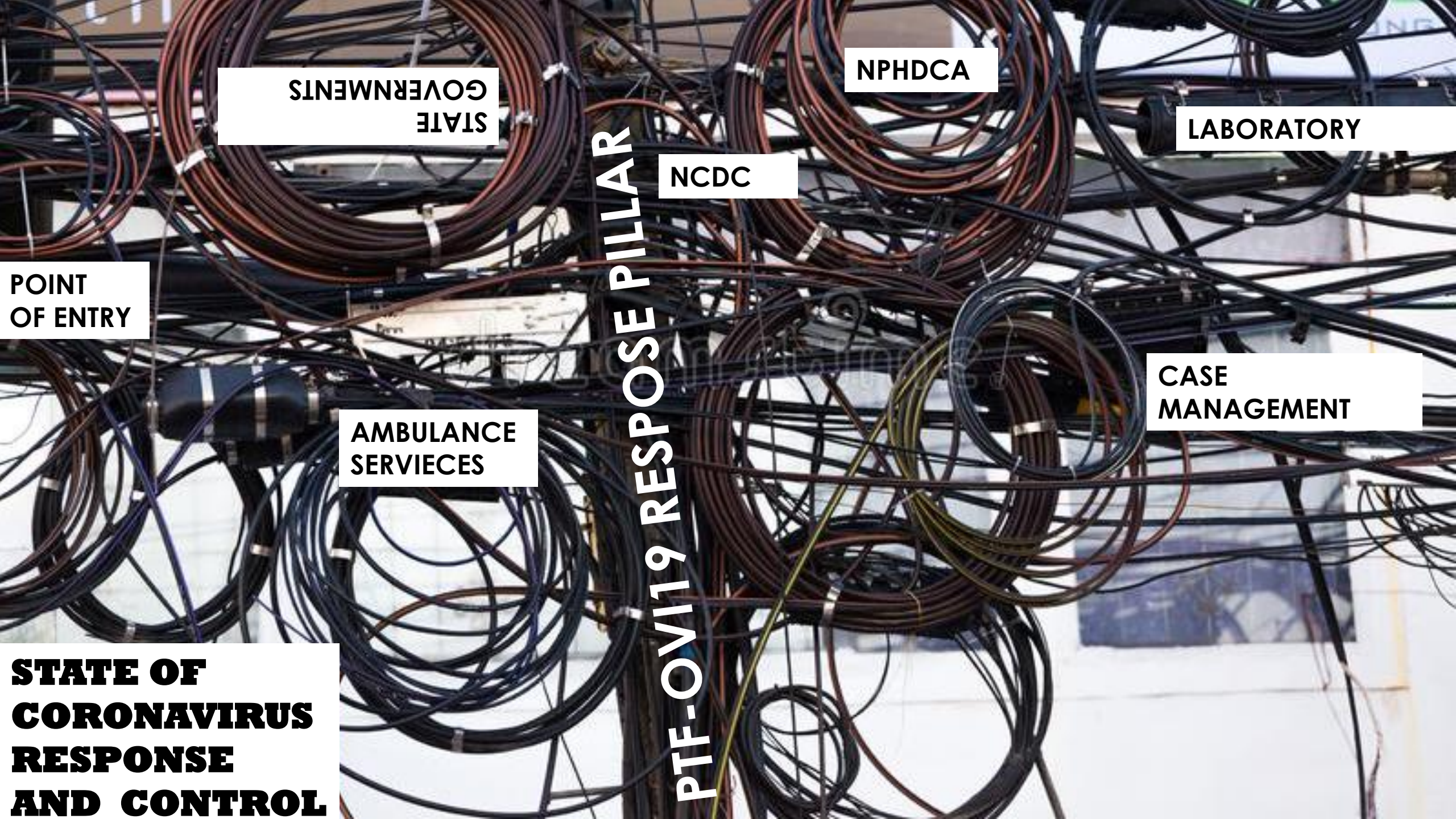
TECHNOLOGY: Uses a cold virus to deliver genetic material from the coronavirus into the body to prompt an immune response.
EFFICACY: Expected to be released by the end of January
PROCESS: Phase 3 clinical trials ongoing
MAJOR BUYERS: EU (160 million doses), US (100 million doses), Canada (40 million doses)
PRICE: Estimated US\$10 per dose
DOSED REQUIRED: 1





NIGERIA COVID19 RESPONSE





STATE
GOVERNMENTS

NPHDCA

LABORATORY

NCDC

POINT
OF ENTRY

AMBULANCE
SERVICES

CASE
MANAGEMENT

**STATE OF
CORONAVIRUS
RESPONSE
AND CONTROL**

PTF-OVI19 RESPONSE PILLAR

SARS-COVID19 NATIONAL TRIPLE CONTROL TOWERS

**TOWERS
OF**



PIZZA



COVID 19
SARS-CoV- 2

See you soon  SOON
in this new Covid19 car

The FGoN will be vaccinating All Eligible populations (18 years and above) through a structured timelines of activities using the T.E.A.C.H Strategy

Mar 1 – Mar 30, 2021

Conduct of electronic registration

Mar 3 – 11, 2021

Ongoing LGA/Ward/HF Trainings

Mar 5, 2021

National Launch in Abuja

Mar 8, 2021

National Roll out for National Assembly, other Tx centers & Ministers etc.

Mar 10, 2021

Vaccination of State VIP: Governors, Commissioners, SEC

Mar 12, 2021

Statewide Rollout

Mar 6, 2021

Vaccination of PMB, VP, FEC

Mar 9, 2021

State launch at Tx centers for Frontline HCWs

Mar 11, 2021

Ward level sensitization (Town Announcer, Comm. Mob.)

Mar 4-19, 2021

Cold Chain assessment and Repairs

Mar 2, 2021

Arrival of vaccines and sample analysis by NAFDAC

Keys

● Training Activities

● COVID-19 Vaccine Launch/Introduction

● Other activities

COVID19 VACCINATION IN NIGERIA – Issues, Issues

- 3.9 MILLION DOSES

UPON ISSUES

- Vaccinate about 4.0 million, no make it 2 million
- Oxford “Ostraci^Zed” Astra-Zeneca or Johnson & Johnson or Unknown Sputnik V
- Roll out issues and Communication issues
- Side Effect Issues – Bloody Clots
- Dilemma of A Beggar Nation – Political Leadership



COVID-19 VACCINATION UPDATE

Electronic Dashboard. April 19th, 2021

TOTAL CLIENTS VACCINATED

1,101,827

PROPORTION VACCINATED

54.8%

1,101,827 eligible Nigerians have so far been vaccinated
with 1st Dose of COVID-19 vaccine

Source: Electronic Management of Immunization Data (EMID) System

NPHCDA – National Primary Health Care Development Agency



Percentage (%) of Total Target Reached with 1st Dose of COVID-19 Vaccine

Source: Electronic Management of Immunization Data (EMID) System Dashboard. 19th April, 2021

S/NO State	Total Clients Vaccinated (1 st Dose)	*Percentage of Target Reached (%)
1 Abia	9,736	31.8%
2 Adamawa	20,252	68.3%
3 Akwa Ibom	12,582	36.5%
4 Anambra	11,111	28.2%
5 Bauchi	36,221	89.9%
6 Bayelsa	10,666	48.3%
7 Benue	22,406	61.2%
8 Borno	21,792	57.7%
9 Cross River	15,293	56.8%
10 Delta	21,475	50.1%
11 Ebonyi	8,946	38.8%
12 Edo	29,269	72.2%
13 Ekiti	22,983	86.8%
14 Enugu	12,316	37.7%
15 FCT	49,299	44.9%
16 Gombe	27,291	76.5%
17 Imo	19,493	48.3%
18 Jigawa	28,298	82.6%

S/NO State	Total Clients Vaccinated (1 st Dose)	*Percentage of Target Reached (%)
19 Kaduna	56,782	63.2%
20 Kano	58,494	55.8%
21 Katsina	39,462	73.4%
22 Kebbi	15,963	55.2%
23 Kogi	11,016	65.2%
24 Kwara	31,208	111.9%
25 Lagos	204,835	80.7%
26 Nasarawa	17,683	57.6%
27 Niger	27,286	73.6%
28 Ogun	53,273	94.2%
29 Ondo	31,486	85.6%
30 Osun	21,267	66.2%
31 Oyo	38,173	59.8%
32 Plateau	28,589	54.1%
33 Rivers	29,060	38.7%
34 Sokoto	11,855	34.5%
35 Taraba	8,965	31.9%
36 Yobe	21,072	68.4%
37 Zamfara	15,929	57.0%

NOTE: States with coverage above 100% have vaccinated more than the 50% of eligible population required for the first dose.

*Percentage of target reached===
Total clients vaccinated (1st dose) X 100%
Total eligible people targeted with vaccines in current phase(s)

MYTHS ABOUT COVID₁₉

- **The novel coronavirus engineered in China lab**
- **COVID-19 is no worse than the flu.**
- **You don't need to wear a mask.**
- **Vaccine created too fast , safety compromised**
- **5G, chips and targets your DNA**



MYTHS ABOUT COVID₁₉

- **The #ENDSARS protest led to increased transmission.**
- **Spikes in cases are because of increased testing.**
- **Achieve herd immunity by letting the virus spread through the population.**
- **Any vaccine will be unsafe/bigger risk than getting COVID-19.**
- **WHAT OTHER MYTHS – READY FOR BURSTING**

COVID19 CLOTS

OAZ 222 /34 million
J&J 6/6.8million
Pfizer/Moderna 3/68 million

-
Polio- VAPP
ranging from one
case per 700,000 to
one case per 3.4
million first doses

Yellow fever

Reporting rates of

- **YEL-A NeurotropicD -
800/1 million doses**

and

- **YEL-A ViscerotrpicD
300/ 1 million doses**

- **both rates increased with
increasing age.**

NIGERIA
COVID19
AEFI

- As of 15th of April 2021, 1,071,346 doses delivered
- 8,439 mild AEFI reported - pain, swelling at inoculation site, body pains and nausea.
- 52 cases of moderate to severe incidents of AEFI reported- fever, vomiting, diarrhea, headaches, dizziness and allergic reactions.
- 5 states with highest AEFI: Kaduna (970) Cross River (859), Yobe (541), Kebbi (511), and Lagos (448).
- no death and no case of blood clots related to the administration of the vaccines.

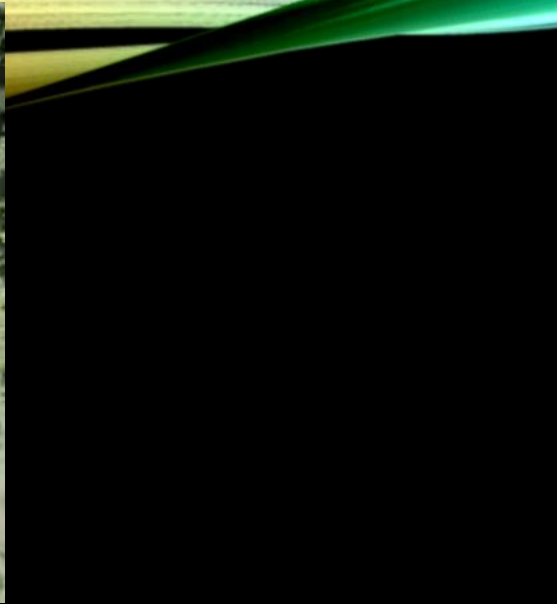


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COVID-19 VACCINES:

TO TAKE AND TAKE IT

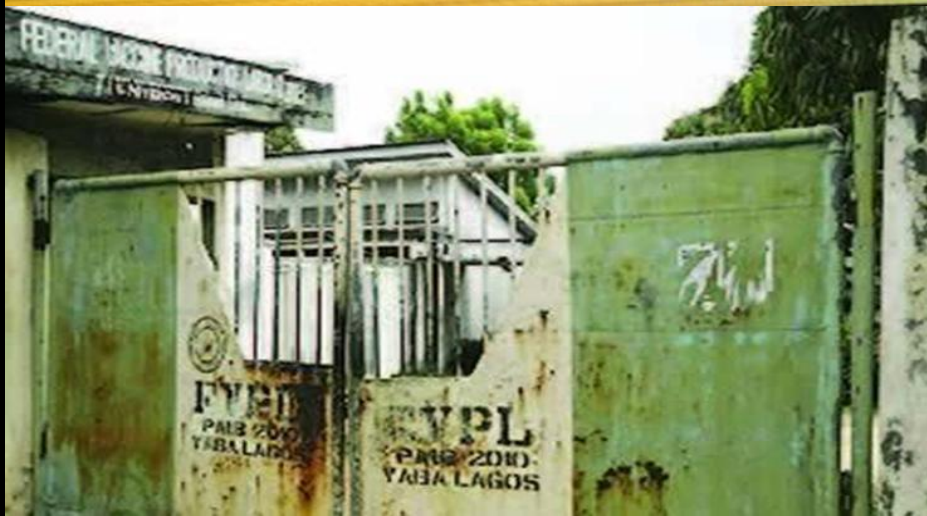
TO TAKE
TO TAKE
TO TAKE
TAKE IT



The Story of Vaccine Production in Nigeria is the story of the 3 Ds- **DECADENCE**, **DECAY** and **DEGENERATION**



DILAPIDATION



FROM



RESUSCITATING VACCINE PRODUCTION IN NIGERIA:

REVITALISATION



TO



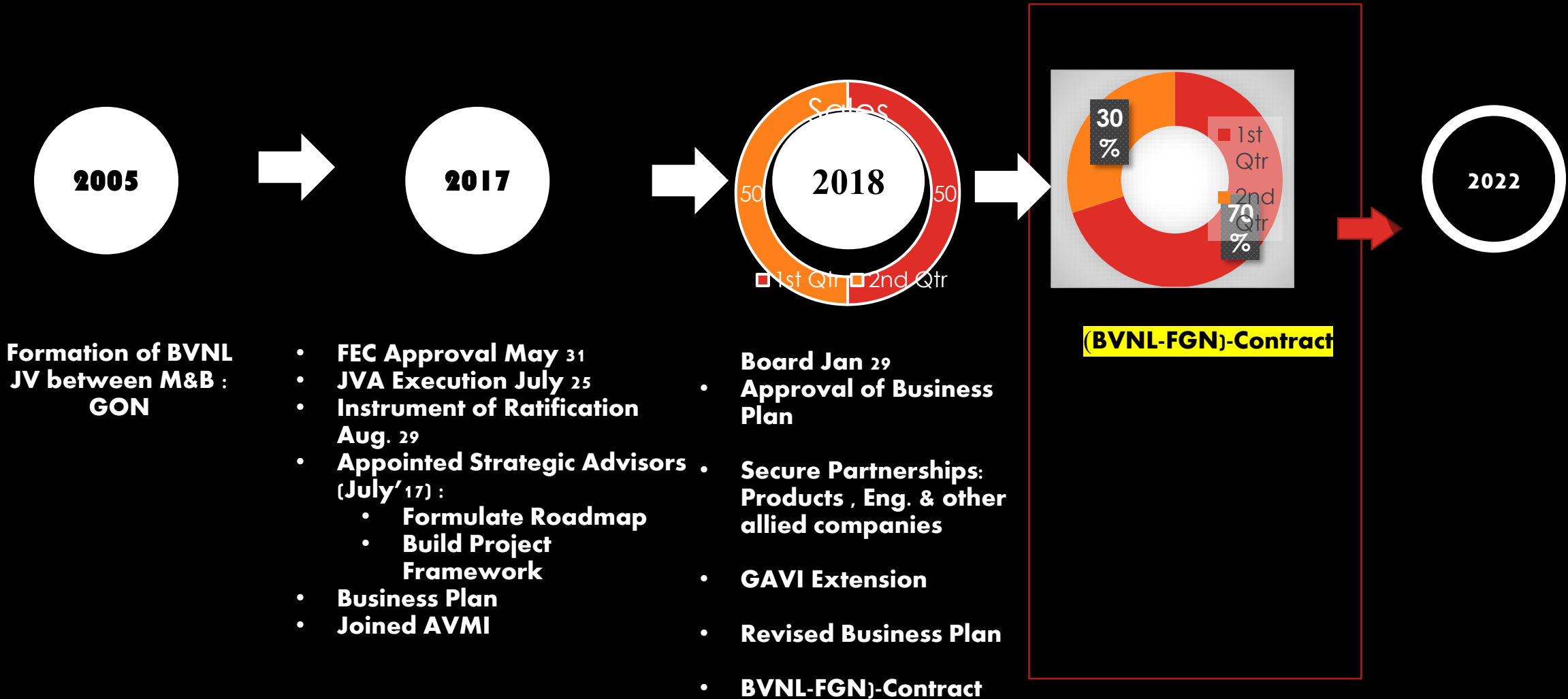
Vaccine production in Nigeria - Human

- **2005** – First coming of Biovaccines Nigeria Ltd (BVNL) Joint PPP between FGN and May and Baker
- **2007** – BVNL project collapsed with change of government
- **2017** - Second coming of BVNL

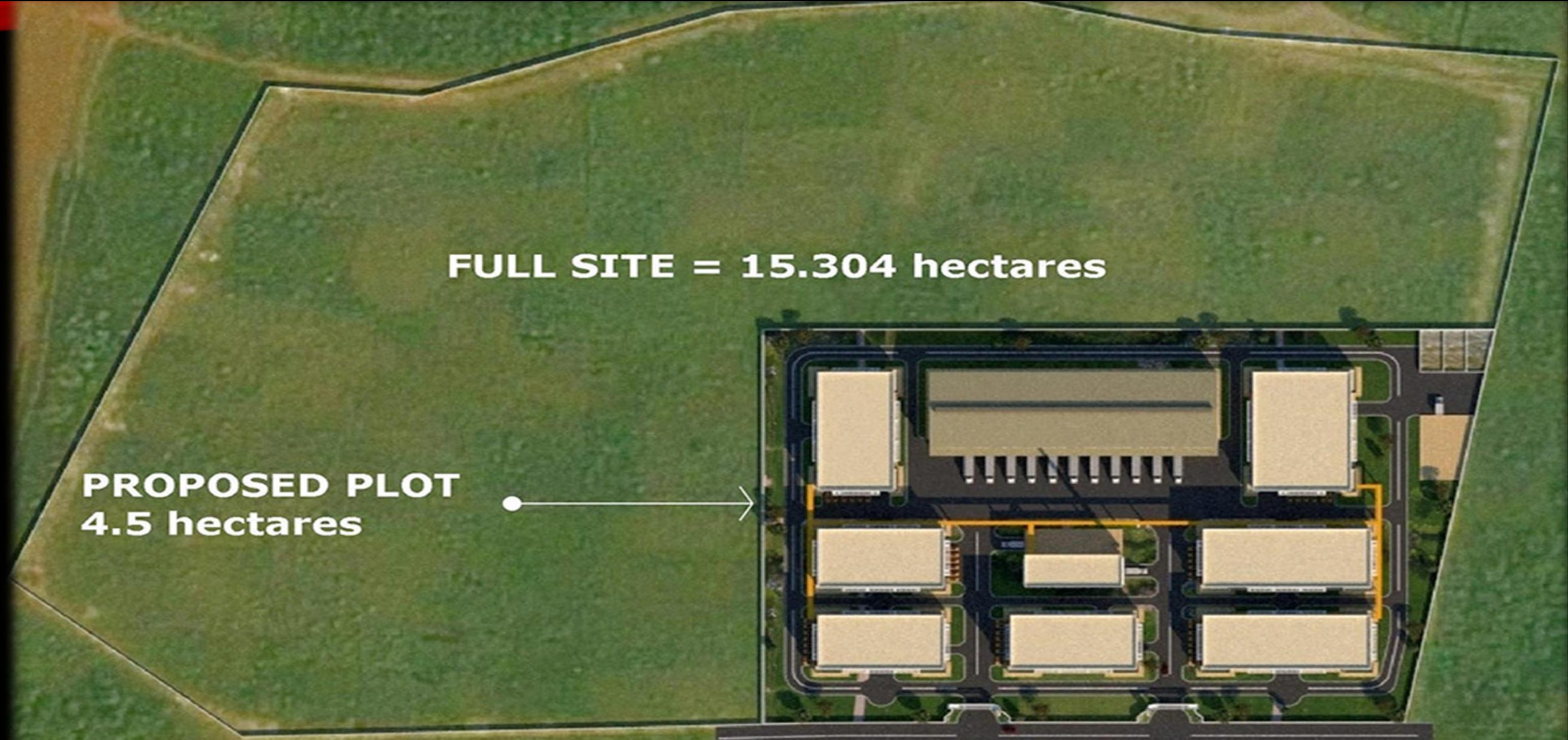


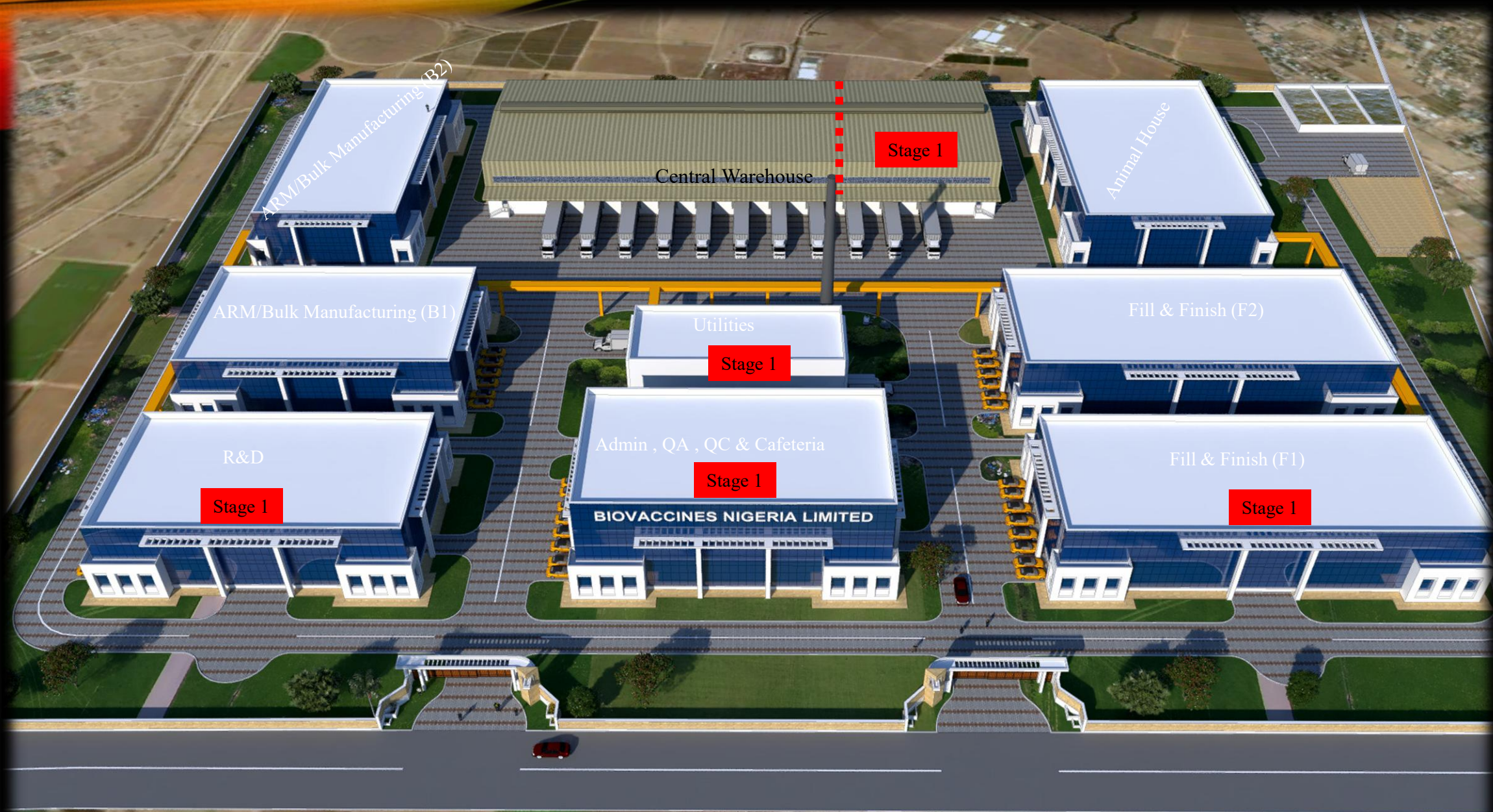
- ✓ **Joint venture between May and Baker Nigeria Plc (51%) and FGN (49%)**
- ✓ **Established to build our national sufficiency in local production of vaccines**
- ✓ **Contribute to the reducing national immunization challenges and ensure national vaccine security.**

BVNL Project Milestones



BVNL INTEGRATED BIOTECH PARK CONCEPT, OTA, OGUN STATE





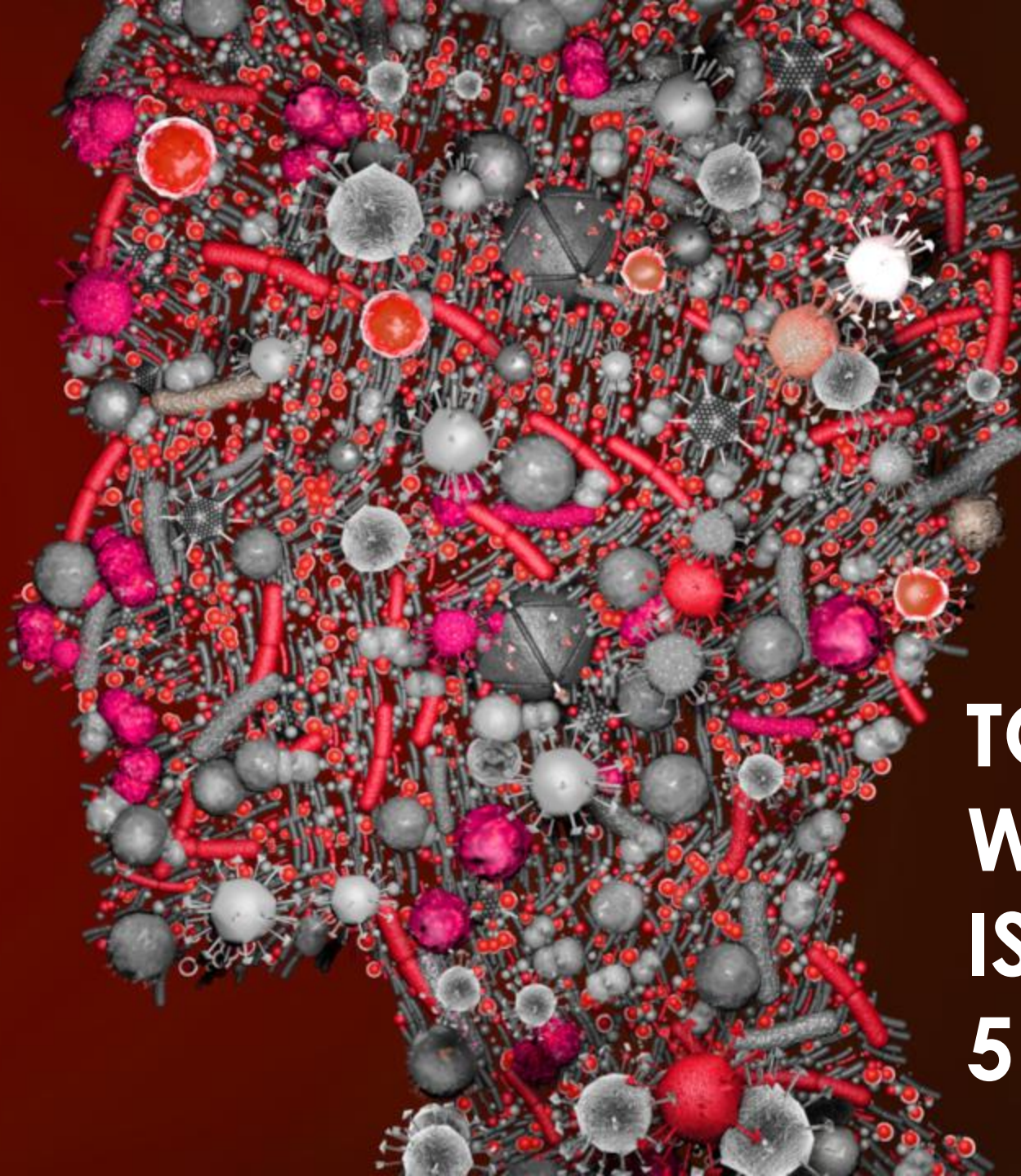
LOCAL VACCINE PRODUCTION- CHALLENGES

- **Hostile environment for doing business**
- **Poor basic infrastructure – power, water etc**
- **Government bureaucracy and inconsistent government policy**
- **Penchant for cutting corners**
- **Lack of respect for integrity, disdain of quality,**
- **Corruption – What is **SIN** is not **SEEN****



**COVID 19 IS A
NATIONAL PROBLEM, IT
CONERNS ALL OF US. WE
EACH HAVE A ROLE TO
PLAY. MY COUNTRYMEN,
PLEASE DO NOT JOKE
WITH IT O**

**WEAR YOUR
FACE MASK**



**TO BE 4
WARNED
IS TO BE
5 ALIVE**

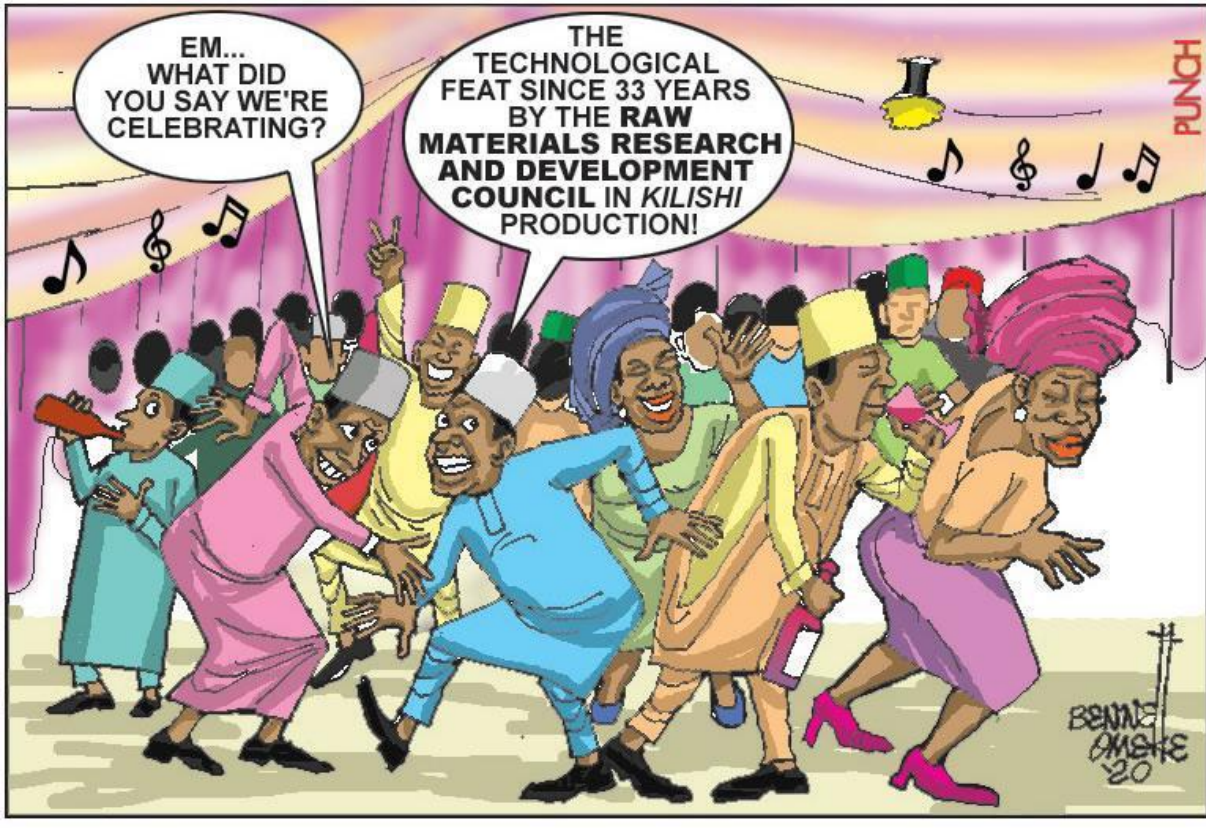


AVOID CROWDED PLACES

**THERE IS ONE VACCINE I RECOMMEND
FOR ALL THE DISEASES OF NIGERIA.... MANUFACTURED
IN THE BEST FACTORY**

**2Ch_7:14 If my people, which are called by my name,
shall humble themselves, and pray, and seek my face,
and turn from their wicked ways; then will I hear from
heaven, and will forgive their sin,
and will heal their land.**

**Mal 3:11-12 And I will rebuke the devourer
(INCLUDING POLITICAL DEVOURERS) for your
sakes, and he shall not destroy the fruits of your
ground.... And all nations shall call you blessed.**



AND CELEBRATE

Distinguished and Eminent Ladies & Gentlemen

