NAAN MUDHALVAN: IBM

PHASE-II

TECHNOLOGY: DATA SCIENCE

PROJECT : INNOVATION FOR COVID-19 VACCINE ANALYSIS

INTRODUCTION:

In early 2020, the SARS-CoV-2 (COVID-19) pandemic unmasked the many flaws that healthcare systems faced worldwide. While some of these issues were difficult to predict, such as the feasibility of pandemic response protocols or federal government regulations to be activated [1], other healthcare issues were to be expected, especially in the United States.

FLOW DIAGRAM:
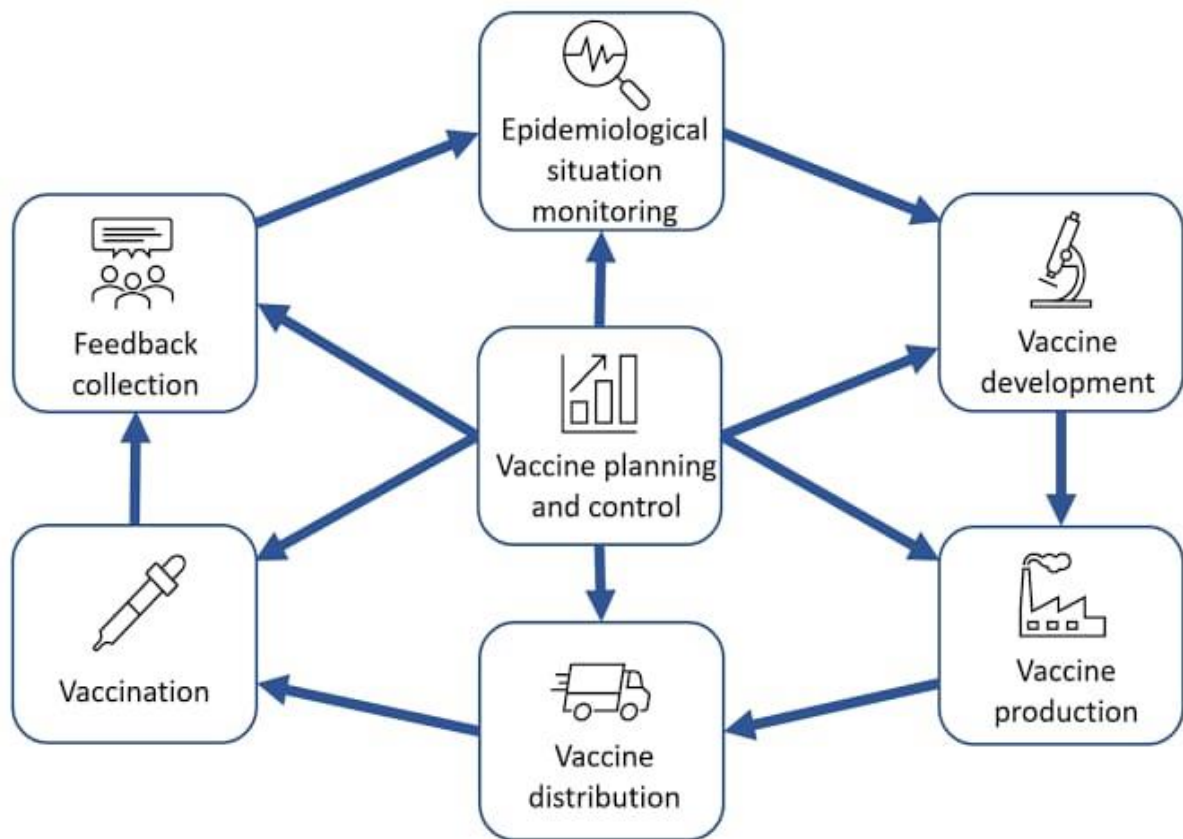
VACCINATION:

Vaccines train your immune system to create antibodies, just as it does when it's exposed to a disease. However, because vaccines contain only killed or weakened forms of germs like viruses or bacteria, they do not cause the disease or put you at risk of its complications.

EPIDEMIOLOGICAL SITUTATION MONITORING:

Globally, during the week of 14 through 20 February 2022, the number of new COVID-19 cases decreased by 21% as compared to the previous week. In addition, the number of new deaths showed a decreasing trend (-8%) when compared to the previous week (Figure 1).

VACCINE PLANNING AND CONTROL:

In the process of preparing to face such threats, and in particular, invisible threats, such as those coming from microorganisms, the knowledge acquired in the last century is indisputable regarding the understanding of the scientific class on the best strategy to combat these pathogens, which is the provision of an effective and safe vaccine.

VACCINE DISTRIBUTION:

Vaccine distribution involves the allocation, transportation, and administration of vaccines to specific populations or regions to control and prevent the spread of infectious diseases. The process typically includes prioritizing high-risk groups, coordinating logistics, ensuring cold chain management, and administering doses following approved guidelines.

FEEDBACK COLLECTION:

On January 30, 2020, WHO declared that the outbreak of the disease caused by the new coronavirus (COVID-19) constitutes a Public Health Emergency of International Importance—the Organization's highest level of alert, as established by the International Health Regulations.

METHODOLOGY:

The methodology used for the study is exploratory and is divided into two stages according to Fig. 2. In the first stage, the monitoring of COVID-19 candidate vaccines under development around the world, through access to reports and public databases, was sought and a study database was generated.

VACCINE DEVELOPMENT:

The main objective of this work is to identify and explore the main factors that provide the rapid advance in the development of vaccines against COVID-19, classifying and characterizing them in different groups in order to facilitate the understanding and thus enabling an appropriate analysis of the complex innovation ecosystem, that contributes to the acceleration of R&D processes of COVID-19 candidate vaccines.

VACCING PRODUCTION:

Regarding the vaccination schedule, most of the developers strategies rely on two doses, being 44 COVID-19 candidate vaccines studying this scheme. It may represent a strategy to increase the vaccine dosage without changing the formulation.