



Ministry of Health & Wellness



World Health  
Organization

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# **National Deployment Vaccination Plan for COVID-19 vaccines in the Republic of Mauritius**

**28 January 2021**

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## **Executive summary**

This National Vaccine Deployment Plan for COVID-19 for the Republic of Mauritius has been prepared on the basis of the World Health Organization's guidance. Mauritius is COVID-19 safe since November 2020. Currently all cases reported on Mauritian soil are of imported origin, there is no local circulation of the virus and the stringent protocols devised by the Ministry of Health and Wellness, and approved by the High Level Committee on COVID-19 chaired by the Honorable Prime Minister, are aimed at maintaining our COVID SAFE status while guaranteeing the health and safety of all Mauritian citizens and residents.

Nearly one year after the first reported cases of COVID-19 in Mauritius, much progress has been achieved in the elaboration of a vaccine against the deadly virus. Such vaccines have been developed in record time and several of them have been granted authorization for emergency use either by the World Health Organisation or by other Regulatory Bodies of international repute. Countries in dire situations with escalating number of new cases and deaths have already initiated their respective vaccination exercises and the global tendency is to resort to large scale immunization in an attempt to protect populations from SARS-CoV2.

The Government of Mauritius acknowledges that mass immunization is a prerogative in the global fight against the pandemic. This National Vaccine Deployment Plan for COVID-19 for the Republic of Mauritius (including Rodrigues and the Outer Islands), outlines the different components of the COVID-19 vaccination programme. This plan has been elaborated with the close collaboration of the World Health Organisation and different stakeholders within the Ministry of Health and Wellness.

The objective of the Ministry of Health and Wellness is to vaccinate at least 60% of its population against the virus with the aim of achieving herd immunity. As COVID-19 is an evolving disease, much is still being learned about both the virus and the vaccines which have been developed to prevent it. Updates will be made to our National Strategy, on the basis of the vaccines used in Mauritius.

## **Abbreviations**

AEFI	Adverse Effect Following Immunisation
CDCU	Communicable Disease Control Unit
DALY	Disability-adjusted-life-years
DHIS	District Health Information System
HIEC	Health Information Education and Communication
ICU	Intensive Care Unit
IVC	International Vaccination Centre
MAUNITAG	Mauritius National Immunisation Technical Advisory Group
MCH	Maternal and Child Health
MOHW	Ministry of Health and Wellness
NCC	National Coordinating Committee
NCD	Non-Communicable Diseases
NDVP	National Deployment Vaccination Plan
NFP	National Focal points
SAGE	Strategic Advisory Group of Experts
SLO	State Law Office
PCR	Polymerase Chain Reaction
PHEIC	Public Health Emergency of International Concern
PPE	Personal Protective Equipment
VIRAT	Vaccine Introduction Readiness Assessment Tool
WHO	World Health Organisation

## **Introduction**

### **COVID 19 in Mauritius**

On 31 December 2019, the World Health Organisation (WHO) China Country Office was informed of cases of pneumonia in Wuhan City, Hubei Province of China. The causative virus was identified as SARS-CoV-2 and the disease as COVID-19.

On 30 January 2020, the Director-General of the World Health Organisation (WHO) declared the novel coronavirus outbreak a Public Health Emergency of International Concern (PHEIC). On 11 March 2020, the WHO declared COVID-19 a pandemic.

On 18 March 2020, Mauritius declared its first three local cases of COVID-19. All 3 cases were imported cases and they led to more infections within the local community. A peak was observed in epidemiological week 14, the first week of April, with 128 cases of COVID 19. This episode of local contamination was contained on 26 April 2020. 10 deaths were notified during this outbreak.

Apart from 2 local cases on 12 and 26 November 2020, no further local case of COVID was detected in Mauritius.

COVID-19 surveillance within the local community is carried out through 5 COVID Testing Centres operational in all 5 regional hospitals of the country. All suspected cases of COVID, that is all persons with symptoms of COVID are screened for SARS CoV2 with a PCR test since March 2020 till date.

Incoming passengers to Mauritius have to comply with a compulsory quarantine period of 14 days. All incoming passengers have to present a negative PCR undertaken within 5 to 7 days test prior to their trip to Mauritius. Upon reaching Mauritius they undergo 3 additional PCR tests on Day 0 and Day 7 of their quarantine period. A final PCR test is carried out on the 14<sup>th</sup> day (Exit Screening) and the passengers are discharged from their quarantine upon obtaining a negative result.

Currently, new variants of SARS-CoV2 have emerged and have rapidly spread throughout the world. The new variants are more contagious and there are concerns that the mutations may decrease the efficacy of current COVID-19 vaccines.

### **Background**

The Republic of Mauritius is found in the middle of the Indian Ocean with a population of 1.30 million (Health Statistics 2019). The country has steadily moved from a low-income agricultural-based economy to a diversified high-income country.

Mauritius is at an advanced stage in its epidemiological transition and is currently facing the demographic challenge of an ageing population coupled with increasing life expectancy and declining fertility rate below replacement level. According to the population and vital statistics 2019, 17 % of the population is aged 60 years and above, the average life expectancy was 74.4 years and the Net Reproduction Rate (NRR) is 0.66. The number of people below 15 years in Mauritius is estimated to be 209, 000 which is 17 % of the population.

Communicable diseases, problems of maternal and child health (MCH) has markedly declined and are controlled effectively. Coverage rates for immunization, ante and postnatal care, and attended births have reached relatively high levels resulting from implementation of comprehensive national maternal child health programmes.

Disease burden, estimated in terms of Disability-adjusted-life-years (DALY) lost, revealed that NCDs accounted for the largest burden and represented 82.9% of DALY lost,

followed by Communicable, maternal, neonatal, and nutritional diseases (10.2%) and Injuries (6.9%).

As COVID-19 is a new disease there are limited data and information about the impact of many underlying medical conditions. However, the evidence available has shown so far that patients with COVID-19 disease who have comorbidities, such as diabetes mellitus hypertension, are more likely to develop a more severe course of the disease. Moreover, patients aged 60 years and above who have comorbidities and are infected, have an increased admission rate into the intensive care unit (ICU) and mortality from the COVID-19 disease. This is of much concern for Mauritius as according to the last NCD Population-based survey (2015), the standardised prevalence of type 2 diabetes in the population aged 25 -74 years was 22.8% and prevalence of hypertension was estimated at 28.4%.

With the pandemic of COVID-19 in the world, the tourism sector in Mauritius has been severely affected with our borders remaining closed till August 2020. Tourism in Mauritius is an important economic driver as well as a significant source of foreign exchange revenues and provides employment to a large proportion of Mauritians. Statistics Mauritius estimated that tourist arrivals has dropped by around 70 per cent in 2020 compared to 2019..With the COVID-19 vaccine, Mauritius hopes to put the sector back on track by opening our borders without imposing the quarantine. COVID vaccines will be a key part of lowering travel risk and restoring international tourism.

### **Lessons learned from Influenza A H1N1**

In March 2009 a novel influenza A (H1N1) caused human infection and acute respiratory illness in Mexico. After initially spreading in the United States and Canada, the virus spread globally, and in June 2009 it was declared as a pandemic.

Operational plan for AH1N1 was done in 2010 and the AH1N1 vaccine was introduced in the same year. In August 2010, the Director General of WHO declared the end of the pandemic. It was pointed out that the H1N1 virus had taken on the behaviour of a seasonal influenza and is still continuing to circulate. Seasonal influenza vaccines which include the AH1N1 component are being given to the public in general every year.

### **Survey at five Regional Hospitals among Healthcare workers on willingness to do the COVID vaccine**

A survey was undertaken in December 2020 among healthcare workers at five regional hospitals with a sample of 1372 workers. The survey has shown an acceptance rate of 63.7%.

## 1. Regulatory preparedness

With a view to guaranteeing prompt access to safe, effective and quality vaccines and given the scope of the existing regulatory system in place for medicines, drugs and other health products, the priority is to institutionalise emergency regulatory procedures that would ensure:

- Expedited assessment of existing information that supports best regulatory decision-making leading to timely vaccine regulatory approvals
- Provision of import permits in the shortest delay possible
- Vaccine lot release or prompt administration

Reviewing WHO Interim Guidance and assessment tool for COVID-19 vaccines introduction readiness<sup>1</sup>, the VIRAT Tool the existing Pharmacy Act and Procurement Act do not warrant any change.

The COVID-19 Vaccine Introduction Readiness Assessment Tool (VIRAT), developed by WHO in collaboration with PAHO is a tool for the national authorities, that allows for the establishment of a roadmap and to monitor progress in the preparation of the activities related to the introduction of the COVID-19 vaccines.

Both legislations set out general administrative procedures for procurement of vaccines on a fast-track basis. The Pharmacy Act (Section 30 Import of Therapeutic substances) covers vaccines under the sixth schedule of the Pharmacy Act and all issues related to import permits and clearances (section 7 of the Pharmacy Act) rests on the Trade and Therapeutic Committee which advises the Pharmacy Board<sup>2</sup> on importation and recommends import permit and customs clearance. The Pharmacy Board has delegated full authority to the Director of Pharmacy services to issue import permits within a period of 24 hours. Authorisation to import the vaccine will be left only to the government sector.

Once the vaccines consignment reaches the Port of Entry in Mauritius, the Government Pharmacist inspects the shipment at the customs and customs clearance is obtained within few hours. Upon receipt after customs clearance the consignment is dispatched to the Central Medical Stores of the MOHW.

Furthermore, the Public Procurement Act (Section 25 and directive 44) makes provision for direct procurement from a single source without competition and caters for emergency procurement to fight COVID-19.

A COVID-19 vaccination consent form containing a “Waiver, Release And Hold Harmless” conditions, as at Annex 1, will have to be signed by all recipients of the vaccines.

### **Actions to be taken:**

- A contractual obligation on the supplier /importer to maintain the cold chain from disembarkation from the airplane to the airport warehouse and from airport warehouse to the MOHW warehouse should be clearly delineated in the contract.
- As per COVAX Facility requirement, the MOHW for any vaccines procured whether under an emergency use authorization or recently licensed, will ensure that manufacturers, donors, distributors, and other stakeholders (the “Indemnified Entities”) will be held harmless by recipients of the vaccine through a “Waiver, Release And Hold Harmless” agreement.

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<sup>1</sup> Vaccine Introduction Readiness Assessment Tool (VIRAT)

<sup>2</sup> In the absence of a National Regulatory Board in Mauritius, the regulatory roles are entrusted to the Pharmacy Board.



*National Vaccine Deployment Plan for COVID 19 in Mauritius*

- To validate policy decision regarding a discretionary grant to be put in place in case of adverse effect following immunization.
- Each vaccine recipient will be provided with vaccine information sheet and a COVID19 vaccination record card (Annex 2)
- The consent form (Annex 1) and the Registration form will be included in one same booklet and will be filled with the help of the vaccination team. This document remains the property of the Ministry of Health and Wellness.

## **2. Planning and Coordination of the Vaccine Introduction**

A High-Level Committee on COVID-19 chaired by the Prime Minister is in place since late January 2020, having as mission to monitor both local and international epidemiological situations of the pandemic and to act as a platform for sharing information and informing strategic public health decision making. Adoption of a whole-of-government approach has allowed timely and informed decision making for a coordinated and scaled up national response.

### **National COVID-19 Vaccination Committee**

A National COVID-19 Vaccination Committee will be set up by the Ministry of Health and Wellness to provide recommendations on vaccine policy in accordance with the Comprehensive Multi-year plan. It is a body of national experts meant to empower the MOHW and advise on all scientific and technical topics related to vaccines and immunization. The advisory group is technical and the decisions/recommendations made are evidence-based and independent of political and industry influence. The group does not implement activities or supervise immunization programmes, but instead provides technical advice on policy analysis and strategy formulation for all vaccine-preventable diseases, and guides the MOHW on identifying and monitoring important data and the latest scientific immunization recommendations and advancements. The National COVID-19 Vaccination Committee will meet on a quarterly basis to advise MOHW on strategies to plan for the introduction of COVID-19 vaccines.

The National COVID-19 Vaccination Committee will consist of:

- Chairperson to be designated by MOHW
- Representative of MAUNITAG
- Representatives from Prime Minister's Office
- Director Health Services (Public Health)
- Director of Laboratory Services
- Consultant in charge of Internal Medicine
- Specialist in Infectious Diseases
- Regional Public Health Superintendent CDCU
- Any other persons designated by the MOHW

The objectives of the National COVID-19 Vaccination Committee are as follows:

- To recommend on choice of vaccines, safety and effectiveness data, immunogenicity, data on vaccine candidates and constantly review and update data on vaccines.
- To oversee on priority groups to receive vaccination.

## National Coordinating Committee

In addition to the high-level committee on COVID-19 mentioned above and the National COVID-19 Vaccination Committee, a National Coordinating Committee (NCC) for COVID-19 vaccine is to be set up.

The composition of the NCC and the Terms of Reference are as follows:

Composition	Terms of Reference
<ol style="list-style-type: none"> <li>1. (Chairperson) to be appointed</li> <li>2. Representatives of the Prime Minister Office (Minister of Defence, Home Affairs and External communications, Minister of Rodrigues, Outer Islands and Territorial Integrity)</li> <li>3. Representative from Ministry of Tourism</li> <li>4. Representative of Ministry of Finance Economic Planning and Development</li> <li>5. Representative from Foreign Affairs, Regional Integration and International Trade</li> <li>6. Representative of Ministry of Social Integration and Social Security and National Solidarity</li> <li>7. Senior Chief Executive of Ministry of Health and Wellness</li> <li>8. Permanent Secretary of Ministry of Health and Wellness</li> <li>9. Island Commissioner for Rodrigues</li> <li>10. Representative of Rodrigues Health Commission</li> <li>11. Chairperson of National COVID-19 Vaccination Committee</li> <li>12. Representative of Medical Council</li> <li>13. Representative Nursing Council</li> <li>14. Representative of Pharmacy Board</li> <li>15. Incident Manager and National Focal Point for Logistics</li> <li>16. National Focal Point for Vaccination</li> <li>17. Representative of WHO</li> <li>18. Representative of Health Promotion Unit</li> </ol>	<ol style="list-style-type: none"> <li>1. Coordinate/support implementation of the National Deployment Vaccination Plan for COVID Vaccines (NVDP)</li> <li>2. Monitor progress of VIRAT tool and NVDP</li> <li>3. Validate/endorse information related to Covid-19 vaccines</li> <li>4. Provide and disseminate reports</li> <li>5. Communicate with partners and media</li> <li>6. Examine the evidence-based recommendations and policy guidance provided by the COVID-19 Vaccination Committee and the three working groups set up related to COVID-19 vaccines, to facilitate decision making by the Government of Mauritius</li> <li>7. Provide feedback to the High-Powered Level Committee on COVID-19</li> </ol>

The Director Health Services (Public Health) will be designated as the Incident Manager and National Focal Point (NFP) for Logistics and the Regional Public Health Superintendent of the Communicable Disease Control Unit (CDCU) will be designated as the National Focal Point for Vaccination.

### **Responsibilities of Incident Manager**

- Manage the overall planning and response in coordination with senior management team of MOHW
- Delegate responsibilities for deployment of vaccines to the NFP for Vaccination
- Support reporting process of outcomes on the deployment and vaccination activities.

***Responsibilities of NFP for Vaccination***

- Responsible for operationalization of the vaccination component of the NDVP, including managing the human resources and financial aspects
- Establishes processes for providing public information.
- Establishes a process for carrying out post-deployment surveillance and management of AEFI, monitoring and evaluating vaccination activities.

***Responsibilities of NFP for Logistics***

- Proposes execution schedule covering shipments of vaccine and the mode of transport of each shipment.
- Oversees process for forecasting, vaccine reception, storage, transport distribution and waste management.
- Establishes processes for data collection, analysis, visualization and communication using management information systems, inventory management system and health facility service capacity assessments.
- Drafts a standard format for information to be collected by each level.
- Establishes process for monitoring and evaluating deployment activities.

### 3. Resources and funding

The Government of Mauritius has approved and signed the Agreement "Committed Purchase Model" under the COVAX Facility Account for the procurement of vaccines for 20% of the population, representing 507,200 doses. The agreement makes provision for a down payment for 507,200 doses at discounted price of US\$1.6 (US\$ 811.520) and a further payment of US\$ 1,188,750 has been effected. A bank guarantee of US\$ 3,350,960 has been furnished by UNDP on behalf of Mauritius to cover the remaining balance due to GAVI Alliance.

All the vaccines procured under COVAX facility will be subjected to WHO Emergency Use Listing Authorization or WHO Pre-Qualification and a basket approach will be followed to allocate vaccines to Mauritius and other member states.

The availability of number of doses of vaccines provided by COVAX facility in the first instance is still unknown. However, we have been informed that in the initial stage, vaccines to cover 3% of the population will be made available. In such an event, the healthcare workforce, personnel at airport and port entries, personnel at quarantine centres and tourism establishments will be covered.

Furthermore, with a view to extending the immunization coverage to at least 60 % of our population, an expression of interest has been sent to 6 pharmaceutical companies/manufacturers, requesting them for information regarding the possibility of Mauritius procuring the vaccines from them. Moreover, the assistance of friendly countries has been sought.

Given that presently, there are known and unknown facts and uncertainties on the availability of the vaccines and no firm commitment on the quantity to be made available at a specific period of time, the Ministry of Health and Wellness has deemed it appropriate to work on the basis of certain assumptions and on different scenario pending the availability of pertinent information. The following scenarios are as follows:

#### Scenario 1:

MOHW will procure vaccines from COVAX facility for 20% population of Mauritius.

Table below shows the estimated cost breakdown.

Description of costs	Estimated costs – MUR (M)
Vaccines (507,200 doses)	214
Consumables (PPE, Sanitizer, Syringes, needles, alcohol swab, etc.)	10
Storage Cost/Cold Chain	10
Freight Cost (5 %)	11
Additional Equipment (Transport, Caravan with cold storage facilities, IT equipment)	20
Sensitization Campaigns	10
Human Resources and stationeries/cards (Training for Vaccinators, Additional HR resources)	15

Vaccines Waste Disposal	5
Contingencies	15
<b>Total Estimated Cost</b>	<b>310</b>

The vaccination cost under this scenario will be met from the Ministry's budget for Medicines, Drugs and Vaccines and from a grant allocated by the UNDP of USD 2M.

**Scenario 2(i):**

MOHW will procure COVID vaccines from manufacturers included under WHO Emergency User Listing (EUL) for an additional 40% population of Mauritius.

The cost breakdown with the same facility and price from Gavi Alliance the estimate is as follows:

Description of costs (40% population)	Estimated costs – MUR (M)
Vaccines (1,014,400) (two doses vaccine)	428
Consumables (PPE, Sanitizer, Syringes, needles, alcohol swab, etc.)	20
Storage Cost/Cold Chain	20
Freight Cost (5 %)	22
Additional Equipment (Transport, Caravan with cold storage facilities)	15
Sensitization Campaigns	10
Human Resources and stationeries/cards (Training for Vaccinators, Additional HR resources)	15
Vaccines Waste Disposal	10
Contingencies	20
<b>Total Estimated Cost</b>	<b>560</b>

The above vaccination cost will be met from the Ministry's budget for Medicines, Drugs and Vaccines from additional funds to be topped up by the Ministry of Finance, Economic Planning and Development and from the National COVID-19 Vaccination Programme Fund. The total vaccination cost to attain a coverage of 60% of the population with the COVAX Facility of the WHO would reach Rs 970M.

**Scenario 2(ii):**

MOHW will procure COVID vaccines from manufacturers validated by WHO for the additional 40% population of Mauritius to cover the whole population and further doses depending on duration of immunity.

Description of costs for Pfizer-BioNTech at USD 20 per dose	Estimated costs – MUR (M)
Vaccines ( <b>40% of population</b> ) (1,014,400 doses)	812
Consumables (PPE, Sanitizer, Syringes, needles, alcohol swab, etc.)	20
Storage Cost/Cold Chain	50
Freight Cost (5 %)	40
Additional Equipment (Transport, Caravan with cold storage facilities)	50
Sensitization Campaigns	10
Human Resources and stationeries/cards (Training for Vaccinators, Additional HR resources)	20
Vaccines Waste Disposal	10
Contingencies	50
<b>Total Estimated Cost</b>	<b>1,062</b>

It is also envisaged that Pfizer vaccines be used primarily for travellers in which case the scenario and budget allocation would need to be revisited.

**Scenario 3:**

MOHW will procure COVID vaccines from a manufacturer included under by WHO Emergency User Listing (EUL) for a further additional 40% population of Mauritius to cover the whole population and further doses depending on duration of immunity.

Description of costs	Estimated costs – MUR (M)
Vaccines on the basis that it is from COVAX Facility	~428
Consumables (PPE, Sanitizer, Syringes, needles, alcohol swab, etc.)	20
Storage Cost/Cold Chain	20
Freight Cost (2 %)	22
Additional Equipment (Transport, Caravan with cold storage facilities)	15
Sensitization Campaigns	10
Human Resources (Training for Vaccinators, Additional HR resources)	15
Vaccines Waste Disposal	10

Contingencies	20
<b>Total Estimated Cost</b>	<b>560</b>

A National COVID-19 vaccination fund has been set up under the Finance and Audit (National COVID-19 Vaccination Programme Fund) regulations 2020 and came into operations on 30 December 2020.

The objects of the National COVID-19 Programme Fund shall be to mobilise and manage the funds required to implement the National COVID-19 Vaccination Programme, including amongst others, the costs of vaccines, storage equipment, air freight and other logistic.

The Fund shall consist of:

- a) Sums received from the Consolidated Fund, public enterprises and statutory bodies;
- b) Contribution or donations made by the private sector;
- c) Contributions or donations, grants and other receipts from any national or international organization or development partners or other friendly countries or persons; and
- d) Any other sum which may lawfully accrue to the Fund.



## 4. Target populations and vaccination strategies

Against the background of constrained COVID-19 vaccines supply the WHO Strategic Advisory Group of Experts (SAGE) developed a Roadmap for Prioritizing Uses of COVID-19 Vaccines that considers priority populations for vaccination. The WHO SAGE values framework for the allocation and prioritization of COVID-19 vaccination advises countries to consider six guiding principles: human well-being, global equity, reciprocity, equal respect, national equity and legitimacy, when determining who should be allocated vaccines and the timing.

Considering the global constrained COVID-19 vaccine supply, current epidemiological landscape (no local case transmission) and adopting a risk-based approach, the following vaccination priority groups and strategies have been proposed.

**The table below shows the Proposed Vaccination Priority Groups and Strategies for the Republic of Mauritius (Mauritius, Rodrigues and outer islands)**

Target population (in order of priority)	Number of additional individuals to be vaccinated	Priority targeted delivery strategy for this population	Total cumulative % of vaccines as a percentage of population
<b>Priority 1</b>			
Frontline healthcare workers	15,000	Healthcare workers at ports of entry, quarantine centres, swabbing team, treatment centres, the health laboratories	1.2
Frontline Police and Prison Officers	5,000	Police at ports of entry, quarantine centres, treatment centres	1.5
Other frontliners	25,000	Other personnel at Ports of entry, quarantine centres, transport personnel	3.5
<b>Total</b>	<b>45,000</b>		
<b>Priority 2</b>			
Other Health care workers (public and private)	9,000	Fixed sites(Primary health care facilities, hospitals,private clinics)	4.2
Other Mauritius Police Force	10,000	Line Barrack and 9 District Police Stations	4.9
Essential workers	52, 000	Workers at ports of entry, quarantine centres, treatment centres and hotel employees	8.9
<b>Total</b>	<b>71,000</b>		
<b>Priority 3</b>			
Person aged 60+	225,000	Social Welfare Centres and outreach for bed- ridden patients	26.2
<b>Priority 4</b>			
Adults with at least 2	280,000	Fixed sites (Regional	47.7

co-morbidities*		hospitals)	
Residents at dedicated homes	3,000	Outreach sessions	48.0
Teaching & non-teaching staff	40,000	Schools and colleges	51.1
Firefighters	1,000	At all Fire Rescue Station	51.1
Staff of supermarkets	10,000	Workplace	51.9
Bank personnel front office	4,000	Workplace	52.2
Scavenging personnel	5,000	Municipal and District Councils	52.6
<b>Total</b>	<b>343, 000</b>		

\*There will be an overlapping of the persons aged 60+ and adults with at least 2 comorbidities as the latter are mostly above 60 years.

The data provided in the table above are estimations of the targeted group.

### Exclusion criteria for COVID vaccines

- **Age groups excluded by specific vaccine protocol**
- **Pregnant women**
- **Severe allergic reaction to a previous dose of COVID-19 vaccine**
- **History of severe allergy**

### Data collection on District Health Information System 2(DHIS) 2 Software Digital Database: The DHIS2 toolkit for COVID-19 vaccine delivery

The DHIS2 toolkit for COVID-19 vaccine delivery expands field-tested designs and tools from the WHO DHIS2 immunization data toolkit to enable countries to rapidly update existing systems to support the equitable delivery of lifesaving COVID-19 vaccines at scale. The focus is on integrating digital solutions for COVID-19 vaccine delivery into the national DHIS2-based immunization systems and strengthening these systems for sustainable impact across all aspects of vaccine preventable disease interventions.

Using DHIS2 for COVID-19 vaccine delivery allows the Republic of Mauritius to build upon existing Mauritius Health Management Information System to incorporate global data standards, introduce fit-for-purpose solutions and leverage local and regional expertise for national roll-out.

The DHIS2 toolkit for COVID-19 vaccine delivery was developed by the DHIS2 and HISP Team at the University of Oslo in collaboration with WHO to follow the WHO Guidance for COVID-19 vaccine delivery. It is intended to help the Republic of Mauritius operationalize the National Action Plan for National Vaccine Deployment and COVID-19 Vaccination Planning.

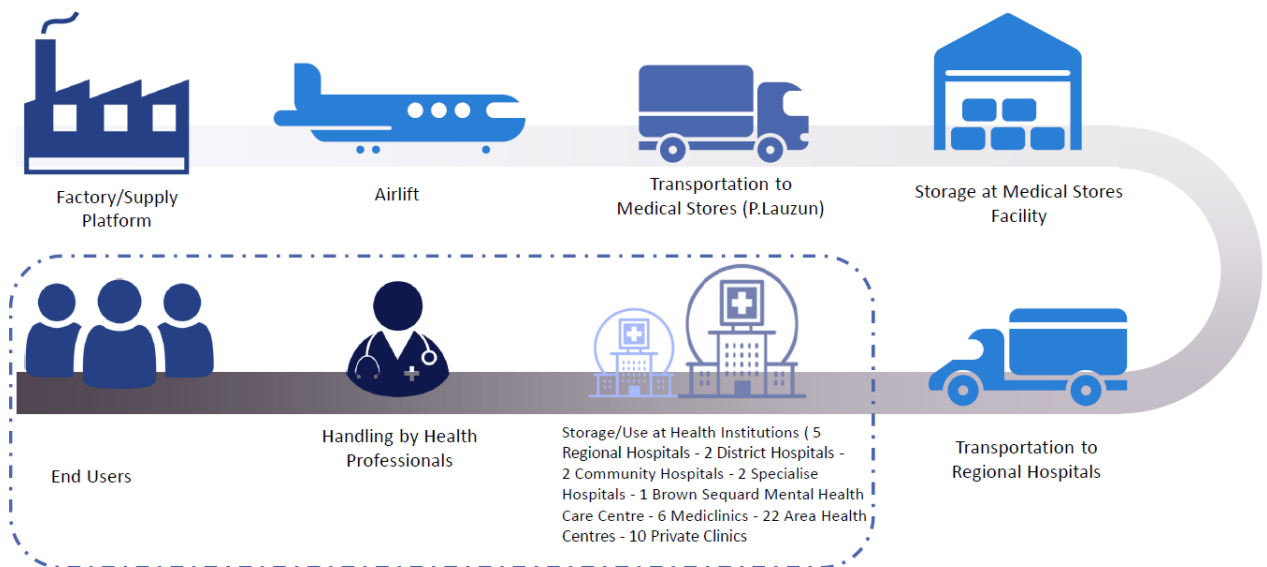


## 5. Supply Chain Management, Service Delivery and Health Care Waste Management

### Distribution process

The national cold store ( at 2-8 °C) has three operational cold rooms for vaccines and medicines. There is an effective inventory management system for vaccines in place. All imported vaccines are transported from the airport to the national medical store in temperature controlled vehicle. Transport from the national store to health care facilities are in cold boxes. Vaccines stored at the national cold room cater for the Expanded Programme of Immunisation and the International Vaccine Centre (IVC) for Travellers.

Vaccine distribution is efficient and well planned for covering all facilities and coordinated with vaccine sessions on same day. From the Mediclinic and Area Health Centres, vaccines are collected each day to provide vaccination sessions at Community Health Centres. Vaccines are transported in cold boxes with ice packs. Remaining vaccines are transported back after the vaccination sessions to the Mediclinic and Area Health Centres in cold boxes.



The table below shows the storage, thawing and reconstitution of the different vaccine types.

Type of vaccines- Cold chain requirement	Storage in Central Stores	Storage in Health facilities/ regional stores	Thawing	Reconstitution
<b>Pfizer-mRNA type vaccines</b> <b>-70 °C</b> <b>Multi dose vial of 5 dose- Dry Powder form</b>	<b>Ultra-cold Freezer</b> or Arkteks (Imported in Thermoshippers*)	Refrigerators at 2-8 °C (Up to 5 days)	Will take up to 2-3 hours for a pack of 25 vials to thaw/defrost. (Once thawed not to be refrozen)	Once thawed, can be reconstituted and used up to 6 hrs or session end whichever is earlier (Thereafter, not to be used)
<b>Moderna-mRNA type</b> <b>-20 °C</b> <b>Coming in 10 dose multidose Vial- liquid form</b>	Deep Freezer up to 6 months	Deep Freezer up to 6 months  Normal Refrigerator up to 30 days	Will take up to 1-2 hrs to thaw	Once thawed and opened use within 6 hrs or session end whichever is earlier (Thereafter, not to be used )
<b>All other vaccine candidates</b>	2-8 °C	2-8 °C	2-8 °C	Once thawed and opened use within 6 hrs or session end whichever is earlier (Thereafter, not to be used)

\* Thermoshippers (package sent by Manufacturers itself with inbuilt thermometers and data loggers)-short term storage up to 30 days (need to charge with 50 pounds of dry ice every 30 days)- Need for cryogenic gloves and eye protection

All the above vaccines are injected at room temperature.

## Supply chain management

### Gaps and challenges:

- We have currently no Ultra cold freezers and no capacity to store vaccines at -70 °C.
- No adequate amount of Temperature monitoring devices
- No dry ice, Cryogenic gloves currently available
- No previous experience on handling vaccines stored at -70°C

### Solutions to be implemented prior to vaccination start date:

- An ultra-cold freezer (capacity 597L) will be procured.  
(There is a sole local representative of the supplier ESCO Global Network, Singapore for that particular equipment.)
- Dry ice, cryogenic gloves and temperature monitoring devices will be procured.
- An International expert already deployed from WHO will help, train and support us in the cold chain maintenance of the vaccines.

### Supply of COVID-19 vaccines

COVID-19 vaccines will be supplied from the Central Supply Division to the 5 regional Hospitals/ Regions for storage and vaccination. The Public Health Nursing Officer (PHNO) of each region will be responsible for the maintenance of the cold chain at the hospital level.

At periphery level, vaccination will be done by the different teams.

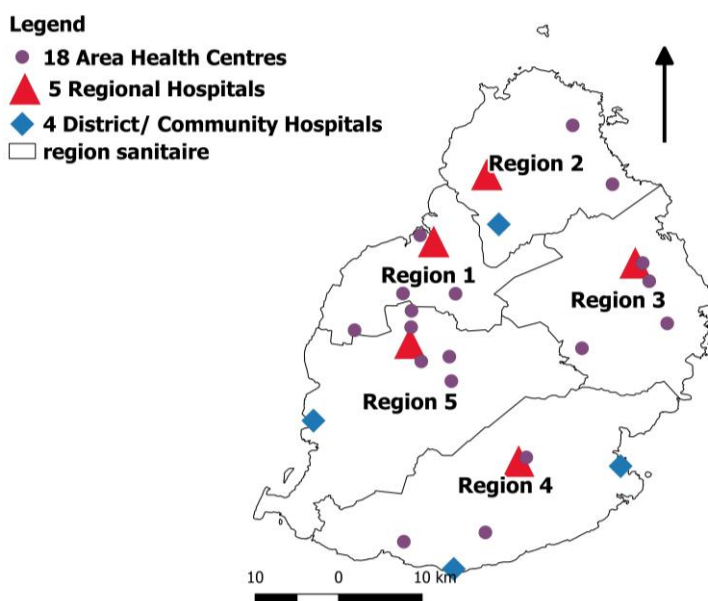
There will be 27 teams, each comprising of:

- 1 Medical and Health Officer (in charge)
- 1 Public Health Nursing Officer
- 2 Male Specialised Nurse (Health Promotion) /Nursing Officer
- 2 Female Specialised Nurse (Health Promotion) /Nursing Officer
- 2 Specialised Healthcare Assistants (Health Promotion)/ Healthcare Assistants
- 1 Attendant
- 1 Driver

### Service delivery of COVID-19 vaccines

Vaccination will be administered at the 5 Regional Hospitals in the beginning of the vaccination campaign for the proper monitoring of side effects.

Later on, the vaccination points will be increased gradually to 27 points, as illustrated in map below.



At each vaccination point, each team will be under the supervision of one Medical and Health Officer. The Specialised Nurse of Health Promotion will be responsible for the collection of data via the DHIS2 software. The Medical and Health Officer will ensure that all variables are correctly filled.

Each vaccine recipient will be given a fact sheet and sign the consent form before vaccination. After vaccination, each person will then be given a COVID-19 vaccination record card with appointment for the second dose. The Record card is at Annex 2.

### **Observation time after vaccine administration**

After the vaccine shot, the vaccine recipient will have an observation period of 30 minutes to monitor for any AEFI.

For patients with previous allergic reactions to food and medications, the observation time period will be prolonged to one hour.

### **Waste Management**

All wastes generated due to the new vaccine will be incinerated at the Brown Sequad Mental Health Care Centre.

An evaluation exercise is being carried out for the procurement of a new incinerator for J. Nehru Hospital. Moreover, UNDP is presently implementing the **COVID Prevention, Response and Early Recovery Project (PREP)** with funding from the Government of Japan and subsequently, the Ministry will benefit a new healthcare waste treatment facility at Victoria Hospital.

Also, the Ministry of Health and Wellness has already embarked on a project under the Global Environment Facility for the setting up of a Central Healthcare Waste Treatment Facility at La Chaumiere in joint collaboration with the UNDP.

## 6. Human resources management and training

Mauritius has a well established Expanded Programme of Immunisation (EPI) in Mauritius with a Principal PHNO at CDCU and 6 senior PHNO in the 5 regions and International Vaccination Centre (IVC).

The PHNO are responsible for the vaccination programme in the country. They are trained in the maintenance of cold chain at 2-8 °C.

The EPI team works in close collaboration with the CDCU Unit.

The Health Promotion Unit also supports the EPI team and CDCU during mass delivery of vaccinations.

It is a priority to Identify already the national human resource needs, prepare a training plan, decide on their training modalities, and plan for supportive supervision.

In terms of capacity building and curriculum development, WHO is preparing training materials for COVID-19 vaccination suitable for a mix training strategies and tools, including Instructor-led; online self-learning and Blended learning. Training will have to be rolled out 3-4 weeks before COVID-19 vaccine introduction launch and ideally training should include small group discussions, demos and skills practice.

Moreover, the WHO will provide Mauritius with an expert in logistics. He will be involved in the training and in the supervision of the supply chain of COVID vaccines.

Supportive supervision is to be strengthened and integrated in the COVID-19 roll out, as in any other vaccination programme. Supportive supervision will guide, monitor, and coach health personnel to promote compliance with standards of practice and to ensure the delivery of quality health services. It also allows supervisors and staff to work as a team to meet common goals and objectives.

### **The following training sessions will be held in Mauritius and Rodrigues:**

- Training on handling of COVID-19 vaccines
- Training on maintenance of cold chain
- Training on DHIS2 (electronic and paper based)
- Training of Hotline workers on reporting side effects of COVID-19 vaccines

A first workshop has been held by the Health Promotion Unit on COVID-19 vaccination the 11 to 15 January 2021 in Mauritius. The personnel of the different vaccination teams were trained on the various topics below:

- Introduction: importance and types of vaccines
- Different types of vaccines
- Training: consent form: Registration form: Guidelines and Administration of vaccines
- Supply chain management and thawing of vaccine
- Maintenance of cold chain especially for Pfizer due to very short shelf life (5 days) at normal refrigerated temperature (2-8° C)
- Pfizer vaccine needs ultra-low freezer/ dry ice for maintenance
- Safety surveillance: Adverse Reactions and management



- Communication strategies
- Waste Management
- Monitoring and Evaluation
- Implementation of the Vaccination Campaign, Staffing Pattern, Role of Staff, Team Management and Target Population

In order to ensure the smooth deployment of the DHIS2 toolkit for COVID-19 vaccine delivery, the following officers and stakeholders will be trained on DHIS2.

The following officers and stakeholders will be targeted for the training:

- a. Public Health Nursing Officers
- b. Personnel of Health Promotion Unit
- c. Personnel of Social Security
- d. Nursing Officers
- e. Medical Health Officers
- f. Pharmacists for AEFI surveillance
- g. EPI Logistics personnel

The building capacity exercises will be organized by the Ministry of Health and Wellness in collaboration with WHO.

## 7. Vaccine acceptance and uptake (demand)

Mauritius has been a Covid-Safe Country since end April 2020 except for two weeks in November as a result of two cases of local transmission. Evidence-based information must be made available prior to the start of the communication campaign; for instance types of vaccine and all other relevant information on the vaccine such as effectiveness/advantages/side effects/good practices and challenges in other countries amongst others. MOHW communication strategies will be aligned with that of the National Communication Committee. The communication strategy is to ensure an ongoing risk communication and community engagement throughout the period of vaccination campaign.

### Actions to be taken:

- Build capacity for training curricula through a Technical Core Group of Health personnel comprising of the following:
  - a. All Director Health Services
  - b. All RPHS
  - c. CDCU
  - d. Health Promotion Unit personnel
  - e. Senior Community Physicians
  - f. Senior Public Health Nurses
  - g. HIEC

They will be provided with all the relevant information on the type of COVID-19 vaccine to be administered and be responsible for dissemination of information. The Technical Core group will be the resource persons used for advocating, sensitizing and providing evidence-based information to the various stakeholders.

- Deploy and activate following platforms for the communication campaign:
  - MBC TV-News item, Dossier, Priorité Santé, scrolls messages, TV spots, Live interventions by health professionals at peak hours (French News and Samachar)
  - Radio programmes both public and private for communication on all aspect of Covid-19 vaccination
  - Production of HIEC materials (flyers, posters, pamphlets)
  - Hotline 8924 to be used so as to relieve apprehension and answer queries from the public (as a reliable source of information).
  - Social Media Campaign-Facebook, covid19.mu, update website of MOHW
- Sensitization of all health personnel by RPHS/Senior Community Physicians in all the 5 Regional Hospitals.
- Communication to different target groups  
A communication strategy for each of the group will be worked out.
- Monitoring and evaluation of communication strategies  
A feedback mechanism would be developed to gauge the effectiveness of the communicate strategy and bring corrective measures accordingly.
- Crisis Communication  
In the event for the need to manage a crisis communication, a core group of health personnel will be constituted for each of the 5 Regional Hospitals so that they can respond in real time to rumours and misinformation and growing apprehension on the vaccine.

## 8. Vaccine safety monitoring and management of AEFI and injection safety

A Pharmacovigilance mechanism will be put in place following introduction of COVID 19 vaccination with the main objective to facilitate the early detection, investigation and analysis of adverse events following immunization (AEFIs) and adverse events of special interest (AESIs) to ensure an appropriate and rapid response.

Specific objectives of safety surveillance system

1. Detect serious AEFIs/AESIs rapidly to provide timely data that can be shared with relevant stakeholders for action;
2. Generate data to characterize the safety of the COVID-19 vaccines in use;
3. Identify, investigate, assess and validate safety signals and recommend appropriate public health or other interventions; and
4. Support public and stakeholder confidence in vaccines and immunization by ensuring high quality safety surveillance.

A Subcommittee (within NCC) on Safety Surveillance of COVID19 vaccination will be set up and members of this subcommittee will include

1. Physician
2. Pharmacist
3. Immunization officer
4. Epidemiologist
5. Microbiologist
6. Administrator
7. Record Officer
8. Infectious Diseases Specialist

Terms of reference of the sub-committee are as follows:

- Set up vaccine safety monitoring mechanisms including active and passive surveillance and reporting of AEFI
- Training and capacity building for detection, investigation and management of AEFI
- Keep track of newly identified AEFI reported in other countries and monitor their occurrence locally
- Assess and improve injection safety
- Set up mechanisms to evaluate vaccine efficacy
- Advise the Minister on matters of vaccine safety and efficacy
- Communicate with all stakeholders on vaccine safety and efficacy

### Specific actions to be taken:

1. Use both vaccine tracking information and passive AEFI reporting information to perform vaccine-specific safety
2. Gather and analyse data on AEFI, prepare and disseminate reports
3. Coordinate the activities between different stakeholders- such as Immunization officers, health care providers
4. Establish Adverse Effect Register to collect details on all mild or severe vaccine reactions being reported including signs and symptoms, treatment, duration of onset etc
5. Training of hotline staff on reporting of side effects of vaccines and advice to be given to public concerning COVID vaccines
6. Protocol on proper management of AEFI to disseminate in case of side effects.

## 9. Immunization monitoring system, disease surveillance and evaluate introduction of COVID-19 vaccines

The monitoring and evaluation of the Covid vaccine is an important component of the action plan. It will enable regular reporting to different stakeholders, namely:

- The decision-makers;
- the public and the press;
- immunization partners, including donor organizations; and
- vaccine manufacturers and regulatory bodies, health researchers and academics.

### Data collection

At the vaccination points, a Specialised Nursing Officer of the Health Promotion Unit will be responsible for the collection of data and entry of data on the DHIS2 software. The data will be sent to the Health Statistics, Health Records Unit and the CDCU. The Demography will provide the denominator/ population data of the target groups.

Variables to be collected at Central Supply Division (CSD) are:

- Type of vaccine and amount of vaccine bought
- Type of vaccine and amount of vaccine available at CSD

Variables to be collected at regional level:

- Total number of Covid vaccines available at the different regions (in stock)
- The date that each stock of vaccines was supplied from CSD to the different regions
- Number of days from supply from CSD to administration of vaccines

Variables to be collected by the Nursing Officer of vaccination team are:

- Name of service provider
- Date of first dose of vaccine
- Date of second dose of vaccine
- Time
- Identification number
- Name
- Age
- Gender
- Address
- Occupation
- Contact no.
- Comorbidities
- Category: frontliners/ essential workers/ elderly, etc...
- Adverse reactions if any

## **District Health Information Software (DHIS) 2**

District Health Information Software (DHIS) 2 is an open-source software that will be used to collect data. It will enable the measurement of vaccine uptake, the coverage by district and region, the coverage of the target groups and the completion of the 2-dose regimen vaccine. It will also monitor the vaccine adverse effects following immunization.

As DHIS2 is new tool, the collection of data will be both paper based and electronic at the beginning of vaccination to ensure accurate and reliable data is obtained.

## **Data cleaning**

Data will be cleaned and analyzed at CDCU by the Statistician and Epidemiologist.

## **Calculation of indicators**

The Statistician and the Epidemiologist will be responsible for the calculation of Indicators and weekly reporting. The following indicators will be calculated:

- Total number of Covid vaccines bought by vaccine type
- Total number of Covid vaccines available at Central Supply Division (in stock)
- Total number of Covid vaccines available at the different regions (in stock)
- Number of people vaccinated with first dose only (by vaccine type specified, by region, by time, age, gender, occupation, comorbidities)
- Number of people who completed both doses of vaccine by age, gender, occupation, comorbidities, vaccine type, region, time
- Number of people who missed second dose and dropout rates per priority group
- Proportion of people vaccinated with first/ completed dose by age, gender, occupation, risk factors/comorbidities by district

## **Tracking defaulters**

The CDCU will provide each vaccination point with a list of people coming for the second dose of the COVID-19 vaccine. If a person has not come for his second dose, the team at the vaccination points will contact the defaulter the following day. In case of non-response, the public health surveillance officers of that region will look for him at his place of residence.

## **COVID-19 vaccination card for travel**

A COVID-19 vaccination card in line with international vaccination certificate format will be provided by the International vaccination Centre (IVC) for those going abroad.

## **Monitoring the COVID-19 Immunoglobulin G antibody in population**

The COVID-19 Immunoglobulin G, Ig G antibody usually rises in a person after COVID vaccination or infection with COVID. Hence, detecting IgG among a sample of the population will give an estimate of the herd immunity.

The laboratory is currently doing the Ig G to detect previous infections of COVID in positive patients.

After vaccination with COVID vaccines, a sample of the population will be randomly selected to detect the COVID-19 IgG antibody to have an estimate of the herd immunity in Mauritius.

## **Actions to be taken:**

Additional reagents for detecting Ig G will be bought at the laboratory level.