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KEMENTERIAN KESIHATAN MALAYSIA

KEMENTERIAN TENAGA, TEKNOLOGI, SAINS, PERUBAHAN IKLIM & ALAM SEKITAR

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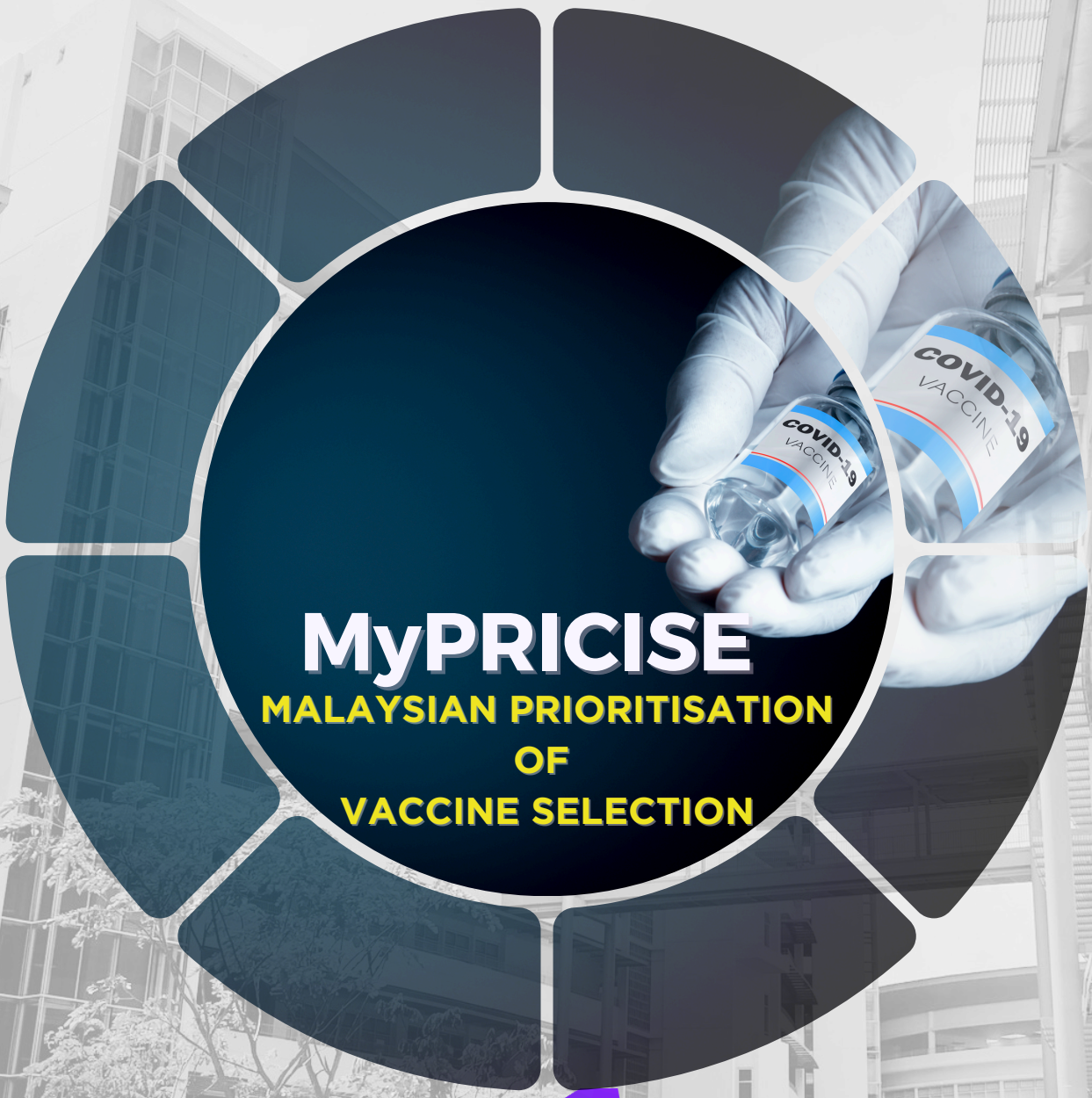

MyPRICISE

MALAYSIAN PRIORITISATION OF VACCINE SELECTION

CENTRE OF HEALTH ECONOMICS RESEARCH (CHEER)
INSTITUTE FOR HEALTH SYSTEMS RESEARCH

Ministry of Health Malaysia

KEMENTERIAN KESIHATAN MALAYSIA

KEMENTERIAN TENAGA, TEKNOLOGI, SAINS, PERUBAHAN IKLIM & ALAM SEKITAR

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MALAYSIAN PRIORITISATION OF VACCINE SELECTION

JULY 2024

This manual outlines a step-by-step approach for using MyPRICISE to prioritize vaccines for local development

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Disclaimer

The views, interpretations, implications, conclusions and recommendations expressed in this manual are those of the contributors alone and do not necessarily represent the opinions of the other investigators participating in the project nor the views or policy of the Ministry of Health Malaysia. MyPRICISE tool has been presented and approved by the vaccine collaborative network subcommittee.

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ABBREVIATIONS

CDC	Centre for Disease Control and Prevention
CEPI	Coalition for Epidemic Preparedness Innovations
CheER	Centre of Health Economics Research
DALY	Disability Adjusted Life Years
EU	European Union
FDA	Food and Drugs Administration
GAVI	Gavi, The Vaccine Alliance
GDP	Gross Domestic Product
GHIT	Global Health Innovative Technology Fund
IHSR	Institute for Health Systems Research
IP	International Property
IVI	International Vaccine Institute
JAKIM	Jabatan Kemajuan Islam Malaysia
MIDA	Malaysian Investment Development Authority
MOH	Ministry of Health
MOPI	Malaysia Association of Pharmaceutical Supply
MOSTI	Ministry of Science, Technology and Innovation
MyIPO	Intellectual Property Corporation of Malaysia
MyPRICISE	Malaysia Prioritisation of Vaccine Selection
NIH	National Institute of Health
NIP	National Immunisation Programme
NMRR	National Medical Research Register
NPRA	National Pharmaceutical Regulatory Agency
PIC/S	Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-Operation Scheme
POC	Proof of Concept
R & D	Research and Development
TRL	Technology Readiness Level
UK- SEA	United Kingdom - South East Asia
UNICEF	United Nations International Children's Emergency Fund
VAERS	Vaccine Adverse Event Reporting System
WHO	World Health Organization
YLD	Years Lived with a Disability
YLL	Years of Life Lost

CONTENTS

INTRODUCTION

INTRODUCTION

MyPRICISE, which stands for Malaysian Prioritisation of Vaccine Selection is a pioneering tool devised to prioritize vaccine development endeavors in Malaysia. The tool is in line with the National Vaccine Development Roadmap, which aims to realize local vaccine development capacity and capability within the next 10 years. By furnishing healthcare professionals, researchers, and industry with comprehensive scientific insights, it aims to facilitate informed decision-making processes for the advancement of national health objectives and a sustainable local vaccine environment.

At its core, MyPRICISE leverages on a comprehensive and weighted importance of a range of critical considerations. The framework was based on 6 main domains which assess epidemiological trends, disease burdens, vaccine efficacy, safety profiles, and logistical feasibilities. The weighted importance of these parameters was synthesized through a series of workshops and engagements with various stakeholders, ranging from researchers, healthcare professionals, policymakers, and academicians to industry leaders. The systematic evaluation process using MyPRICISE allows for the evidence compiled to be translated into a tangible scoring which provides a holistic overview of a vaccine candidate.

The primary aim of MyPRICISE is to be a user-friendly tool to guide governmental and funding agencies in distinguishing and prioritizing candidates from a range of potential vaccines that can be developed locally. Applications and suggestions of vaccine candidates, for example, can be evaluated with utmost objectivity and clarity through a series of selected parameters. This ensures a fair and transparent process, instilling trust in the stakeholders as they navigate the complex landscape of vaccine development.

Additionally, MyPRICISE also furnishes the industry players with a more transparent and objective view of the selection criteria adopted in paving the path toward developing a local vaccine. By enhancing transparency and evidentiary requirements, it is hoped to support pharmaceutical companies to make informed decisions to optimize research investments and foster focused research and capacity building. The transparency of the decision-making process also allows for any gaps in evidence for the potential vaccine to be identified. This in return can drive research and empower relevant parties to update current knowledge.

Beyond its conventional functionalities, the formation process and future application of MyPRICISE aspire to foster collaboration among diverse stakeholders within the healthcare industry, promoting synergy and collective action toward the advancement of public health objectives. By providing a platform for communication and data sharing, it facilitates cooperation among government entities, research institutions, and private firms. The network and trust built during the development of MyPRICISE are hoped to continue to flourish and form a strong united frontier in facing future health challenges.

With Malaysia's healthcare journey to becoming a hub for vaccine development having just begun, MyPRICISE embodies the government's ambition to initiate innovation, collaboration, and targeted collective endeavors as the initial stride toward shaping the future trajectory.

MyPRICISE : DICTIONARY

MyPRICISE : DICTIONARY

The dictionary outlines the definitions for each parameter within the six domains of the MyPRICISE tool, as shown in the figure below.
The sources provided are either websites or institutions where the data is accessible. However, it's important to note that certain data might not be publicly available, necessitating special requests before access can be granted.

1.0 NATIONAL VACCINE POLICY

2.0 MARKET ATTRACTIVENESS

3.0 VACCINE TECHNOLOGY ADVANCEMENT

4.0 ECONOMIC CONSIDERATIONS

5.0 VACCINE ECOSYSTEM

6.0 VACCINE PROPERTIES

1.0 NATIONAL VACCINE POLICY

1.1 LISTED IN NIP

DEFINITION
National prioritization of vaccine based on the Malaysian National Immunisation Schedule or required by law or recommended by MOH.

SOURCES
- The Malaysian National Immunisation Programme (NIP)
- Guidelines for Adult Immunisation published by the Malaysian Society of Infectious Diseases and Chemotherapy
- CDC Travel Health Advice CDC (https://wwwnc.cdc.gov/travel/destinations/list)
- World Health Organization (WHO) (https://immunizationdata.who.int/pages/schedule-by country/mys.html)
- International Health Regulation 2005
- Any relevant national / international laws / regulations
- Any relevant immunization guidelines in Malaysia

1.2 NATIONAL TARGET

DEFINITION
To eliminate, eradicate, or control vaccine-preventable diseases based on local or international guidelines, such as those provided by organizations like the CDC and WHO. For example, while Polio remains a target for maintaining eradication status, diseases like Measles and Rubella are focal points for elimination efforts. Additionally, diseases such as Tuberculosis and Rabies are prioritized for effective control measures.

For example, while Polio remains a target for maintaining eradication status, diseases like Measles and Rubella are focal points for elimination efforts. Additionally, diseases such as Tuberculosis and Rabies are prioritized for effective control measures.

SOURCES
- Disease specific programme

(e.g. The National Malaria Elimination Strategic Plan; Malaysia National Tuberculosis Control Programme)

1.3 HIGH-RISK GROUPS

DEFINITION
Government policy on protecting population population who are at risk* of the vaccine preventable diseases.

* Population who have an increased risk of contracting illness or increased risk for severe illness due to demography, medical condition, geographical location, or a combination of these risk factors (e.g. pregnant women / children / elderly /poor health status / occupational hazard / immigrants).

SOURCES
- Vaccination for all life stage

Protecting Malaysians Through Immunisation - Immunise4Life
- Vulnerable groups

(https://www.malaysia.gov.my/portal/subcategory/759)
- Any relevant policy documents

2.0 MARKET ATTRACTIVENESS

2.1 LOCAL DISEASE BURDEN

DEFINITION
The specific impact of a particular disease in term of Disability Adjusted Life Years (DALY).

DALY: the sum of the years of life lost due to premature mortality (YLLs) and the years lived with a disability (YLDs) due to prevalent cases of the disease or health condition in a population.

SOURCES
- Global Burden of Disease (https://www.healthdata.org/research-analysis/gbd)
- Disease incidence (health facts, MOH report).
- Scientific literature or reports on disease prevalence, incidence, and burden in Malaysia

2.2 LOCAL MARKET VALUE

DEFINITION
Estimated monetary worth of vaccine technology and vaccine within specific region.

SOURCES
- Government procurement of vaccines sales data
- Company or manufacturer data

2.3 CURRENT LOCAL DEMAND (NUMBER OF ANNUAL DOSES)

DEFINITION
The required quantity of vaccine doses needed locally over a one year time frame.

SOURCES
- Company or manufacturer data

2.4 POTENTIAL SHORTAGE OF VACCINES

DEFINITION
The risk or possibility of insufficient vaccine supply within a specific region or country.

SOURCES
· World Vaccine Congress
· Malaysia Association of Pharmaceutical Supply (MOPI)
· Scientific literature or reports on potential shortage of vaccines

2.0 MARKET ATTRACTIVENESS

2.5 POTENTIAL FUTURE OUTBREAK	**DEFINITION** The anticipation of infectious disease occurrences globally/locally as indicated by WHO and other relevant/related authorised agencies. **SOURCES** • World Health Organization (WHO) • Coalition for Epidemic Preparedness Innovations (CEPI)
2.6 NUMBER OF VACCINE IN GLOBAL MARKET	**DEFINITION** The number of vaccine products available worldwide to address various infectious diseases, subject to regulatory approvals and public health needs. **SOURCES** • Global Regulatory Database
2.7 HALAL CERTIFICATION	**DEFINITION** Vaccine that has been deemed permissible and lawful according to Islamic Dietary Laws and Principles (JAKIM). **SOURCES** • Jabatan Kemajuan Islam Malaysia (JAKIM)

3.0 VACCINE TECHNOLOGY ADVANCEMENT

3.1 LOCAL MANUFACTURERS CAPABILITES

DEFINITION

Capabilities, resources, and physical readiness possessed by manufacturers in Malaysia for vaccine production.

SOURCES

- Company or manufacturer data
- Malaysian Investment Development Authority (MIDA) (https://www.mida.gov.my)

3.2 TECHNOLOGY MATURITY AT GLOBAL CONTEXT

DEFINITION

Level or stage of the technology and the establishment of the technology platform used to produce vaccines (well-established or newer technology).

SOURCES

- NMRR - National Medical Research Register (https://nmrr.gov.my)
- Scientific literature or reports on the technology maturity
- Clinical Research (https://clinicalresearch.my)
- Clinical Trial (https://clinicaltrials.org)

3.3 ADOPTABLE VACCINE TECHNOLOGY

DEFINITION

The ability of a specific technological approach or method to be adopted/adapted successfully for the development, production, or distribution of vaccines.

SOURCES

- Country's specific data or licensing authority website, e.g., Food and Drug Administration (FDA)
- National Pharmaceutical Regulatory Agency (NPRA) (http://npra.gov.my)

3.4 TECHNOLOGY READINESS LEVEL

DEFINITION

The advancement and preparedness of vaccine technologies, as well as the technical maturity of a technology during its acquisition phase, are evaluated through the Technology Readiness Levels (TRL), which comprise nine levels. TRL is a measurement system assessing the maturity level of a technology by evaluating progress project against predefined criteria.

SOURCES

- Company and manufacturer data

3.5 LOCAL R&D ACTIVITIES

DEFINITION

The level of Research and Development activities at local setting which includes early-phase studies (e.g. discovery and proof of concept), preclinical studies and clinical trials stages in Malaysia.

SOURCES

- NMRR - National Medical Research Register (https://nmrr.gov.my)
- Scientific literature or reports on the technology maturity
- Clinical Research (https://clinicalresearch.my)
- Clinical Trials (https://clinicaltrials.org)

***IN THIS DOMAIN, VACCINE TECHNOLOGIES REFERS TO:**

Live attenuated or replication - competent attenuated vaccine, whole inactivated vaccine (killed vaccine), virus like particles (VLPs vaccine), synthetic peptide vaccine, fractional inactivated vaccine , polysaccharide and polysaccharide conjugate vaccines , bacterial vectored vaccine, viral Vector based vaccines, synthetic DNA vaccine, mRNA based vaccine and others.

4.0 ECONOMIC CONSIDERATIONS

4.1 AVAILABILITY OF FUNDING OR FUNDING PARTNERS

DEFINITION

Availability of funding or funding partners for development of vaccines. This can also be potential funders, where the vaccines to be developed fits the criteria of funds being offered and can be applied by the developers.

SOURCES

- Based on available local/global funders, not limited to CEPI, Bill and Melinda Gates foundation, International Vaccine Institute (IVI), United Kingdom - South East Asia (UK - SEA) Vaccine Hub, European Union Horizon, Gavi, The Vaccine Alliance (GAVI), United Nations International Children's Emergency Fund (UNICEF), Global Health Innovative Technology Fund (GHIT), World Health Organization (WHO) etc.

4.2 COST-EFFECTIVENESS OF VACCINATION

DEFINITION

Availability of evidence demonstrating vaccine being cost-effective locally or internationally. For local evidence, cost-effectiveness should be based on willingness to pay threshold of 1 to 3 GDP per capita of the evaluation year. If local evidence is not available, cost-effectiveness of the vaccination can be based on the threshold of the published study.

SOURCES

- Scientific literature or reports on cost-effectiveness analysis of the vaccine

5.0 VACCINE ECOSYSTEM

5.1 HUMAN RESOURCES & EXPERTISE

DEFINITION

Collective multidiscipline personnel skills, involving scientific, manufacturing, regulatory, and public health professionals to ensure the successful development and deployment of vaccines.

Availability of technical expertise in R&D, production fields for different types of technology and type of disease.

SOURCES

- Ministry of Science, Technology and Innovation (MOSTI)
- Company or manufacturer data

5.2 INTELLECTUAL PROPERTY ACCESS

DEFINITION

Authorization granted to third party to use or commercialize intellectual property of vaccine owned by other entity.

Readily available intellectual property (IP) refers to products that are either out of patent protection or accessible locally. For detailed information on access to intellectual property, data may be needed from the developers.

SOURCES

- Intellectual Property Corporation of Malaysia (MyIPO)
- World Intellectual Property Organization

5.3 COLLABORATION & PARTNERSHIP

DEFINITION

The presence of collaboration and partnership with established partners (conditional international provision/accessible partnership/credibility/ commercialization/ matching grants).

SOURCES

- Company or manufacturer data

6.0 VACCINE PROPERTIES

6.1 VACCINE SAFETY	**DEFINITION** Availability of thorough evaluation and assurance that vaccines are harmless and pose minimal risk of adverse effects when administered to individuals. **SOURCES** • Literature reviews or reports of vaccine safety • CDC Vaccine safety (https://www.cdc.gov/vaccinesafety/index.html) • CDC Vaccine safety reports, Vaccine Adverse Event Reporting System (VAERS) (https://wonder.cdc.gov/controller/datarequest)
6.2 VACCINE EFFICACY OR EFFECTIVENESS	**DEFINITION** Availability of data on vaccine efficacy refers to the measure of a vaccine's ability to prevent disease and potentially transmission under ideal and controlled circumstances, typically determined through clinical trials. On the other hand, vaccine effectiveness refers to how well a vaccine performs in real-world conditions, considering factors like variations in populations, healthcare settings, and exposure. **SOURCES** • Literature reviews or reports of vaccine efficacy and effectiveness • CDC Vaccine safety (https://www.cdc.gov/vaccinesafety/index.html) • CDC Vaccine safety reports, VAERS (https://wonder.cdc.gov/controller/datarequest)

MyPRICISE : FRAMEWORK

MyPRICISE FRAMEWORK

1.0 NATIONAL VACCINE POLICY

PARAMETERS	MERITS	SCORING	WEIGHT PARAMETER (SHORT TERM)	WEIGHT DOMAIN (SHORT TERM)	WEIGHT PARAMETER (LONG TERM)	WEIGHT DOMAIN (LONG TERM)
1.1. Listed in NIP	Listed in NIP	1	45.16%	**22.97%**	44.60%	**23.91%**
	Not listed in NIP but required by local or international law	0.7				
	Not listed in NIP and not required by law but recommended by MOH	0.5				
	Not listed in NIP, not required by law, no recommendation by MOH	0.1				
1.2. National Target	National target for eradication	1	29.22%		29.84%	
	National target for elimination	0.8				
	National target for control	0.6				
	No national target	0.2				
1.3. Susceptible Groups	Cover at least 3 groups	1	25.63%		25.47%	
	Cover at least 1 groups	0.6				
	None	0.1				

MyPRICISE FRAMEWORK

2.0 MARKET ATTRACTIVENESS

PARAMETERS	MERITS	SCORING	WEIGHT PARAMETER (SHORT TERM)	WEIGHT DOMAIN (SHORT TERM)	WEIGHT PARAMETER (LONG TERM)	WEIGHT DOMAIN (LONG TERM)
2.1. Local Disease Burden	≥ 10,000 DALY	1	19.50%	**19.38%**	18.56%	**20.22%**
	5,000 – 10,000 DALY	0.7				
	< 5,000 DALY	0.2				
2.2. Local Market Value	≥ RM50 million annual sales	1	19.38%		18.16%	
	< RM50 million annual sales	0.5				
2.3. Current Local Demand (Number of doses annually)	> 1,000,000 doses	1	15.63%		14.38%	
	500,000 - 1,000,000 doses	0.8				
	< 500,000 doses	0.5				
2.4. Potential Shortage of Vaccines	Local history of shortage	1	14.91%		15.47%	
	Risk of shortage (single supplier)	0.5				
	No shortage	0.2				
2.5. Potential Future Outbreak (indicated by WHO)	Yes	1	11.30%		13.53%	
	No	0				
2.6. Number of Available Vaccine Product in the Global Market	No vaccine in the market	1	9.72%		9.16%	
	Single vaccine available	0.8				
	2 - 3	0.5				
	More than 3	0.2				
2.7. Halal Certification	Halal certified	1	9.56%		10.75%	
	In the process of obtaining Halal certification, or not yet certified.	0				

MyPRICISE FRAMEWORK

3.0 VACCINE TECHNOLOGY ADVANCEMENT

PARAMETERS	MERITS	SCORING	WEIGHT PARAMETER (SHORT TERM)	WEIGHT DOMAIN (SHORT TERM)	WEIGHT PARAMETER (LONG TERM)	WEIGHT DOMAIN (LONG TERM)
3.1. Local Manufacturers Capabilities	Yes (physical & resources readiness)	1	22.88%	**15.83%**	23.66%	**13.86%**
	Yes (Formulation fill & finish)	0.7				
	Yes (Fill & finish)	0.4				
	No	0				
3.2. Technology Maturity at Global Context	Technology market authorized	1	21.94%		18.50%	
	Proof of concept technology (POC)	0.5				
	Emerging Technology	0.1				
3.3. Adoptable Vaccine Technology	WHO prequalified / Pharmaceutical Inspection Co-Operation Scheme Proof of Concept (PIC/S) member country approved	1	20.31%		18.13%	
	Local country of origin regulatory body approved	0.4				
3.4. Technology Readiness Level	TRL 7 to TRL 9	1	19.38%		18.59%	
	TRL 4 to TRL 6	0.6				
	TRL 1 to TRL 3	0.3				
3.5. Local R&D Activities	Study at clinical trial stage	1	15.50%		21.13%	
	Study at pre-clinical trial stage	0.5				
	Study at POC stage	0.3				
	Study at discovery stage	0.1				

MyPRICISE FRAMEWORK

4.0 ECONOMIC CONSIDERATIONS

PARAMETERS	MERITS	SCORING	WEIGHT PARAMETER (SHORT TERM)	WEIGHT DOMAIN (SHORT TERM)	WEIGHT PARAMETER (LONG TERM)	WEIGHT DOMAIN (LONG TERM)
4.1. Availability of Funding or Funding Partner	2 or more funding	1	50.47%	**15.08%**	47.03%	**15.08%**
	1 funding	0.5				
	No funding	0				
4.2 Cost-Effectiveness of Vaccination	Local data available (less than 1 Gross Domestic Product (GDP) per capita)	1	49.53%		52.97%	
	Local data available (1 to 3 GDP per capita)	0.8				
	Local data available (more than 3 GDP per capita)	0.5				
	No local data, international data shows cost effectiveness	0.2				
	No local and international data on cost- effectiveness	0				

MyPRICISE FRAMEWORK

5.0 VACCINE ECOSYSTEM

PARAMETERS	MERITS	SCORING	WEIGHT PARAMETER (SHORT TERM)	WEIGHT DOMAIN (SHORT TERM)	WEIGHT PARAMETER (LONG TERM)	WEIGHT DOMAIN (LONG TERM)
5.1. Human Resources & Expertise	Availability of expertise in relevant technology (for development of Malaysian own vaccine / vaccine platform)	1	38.44%	**13.52%**	43.75%	**12.95%**
	Availability of expertise for receiving technology (for manufacturing top-down project)	0.8				
	No expertise available	0				
5.2. Intellectual Property (IP) Access	Readily available Intellectual Property (IP)	1	32.19%		30.00%	
	Outright purchase / own development vaccine / possible purchase / purchase with restrictions	0.5				
	Late IP Expiry (more than 5 years)	0.2				
5.3. Collaboration & Partnership	Availability of partnership (international / local) in relevant technology	1	30.00%		26.88%	
	Availability of partners (international / local) to out license technology under favorable term (for manufacturing top-down project)	0.8				

MyPRICISE FRAMEWORK

6.0 VACCINE PROPERTIES

PARAMETERS	MERITS	SCORING	WEIGHT PARAMETER (SHORT TERM)	WEIGHT DOMAIN (SHORT TERM)	WEIGHT PARAMETER (LONG TERM)	WEIGHT DOMAIN (LONG TERM)
6.1. Vaccine Safety	Available proven safety data	1	52.50%	**13.23%**	53.44%	**13.98%**
	In development with some safety data	0.5				
	No safety data available	0.2				
	Previous safety concern	0				
6.2. Vaccine Efficacy or Effectiveness	Available proven efficacy / effectiveness data	1	47.50%		46.56%	
	In development with some efficacy / effectiveness data	0.5				
	No efficacy data available	0.2				
	Data proves the vaccine is ineffective	0				

MyPRICISE SCORING PROCESS

MyPRICISE SCORING PROCESS

DATA COMPILATION

STEP 1 :

Compile all information from the data sources listed in the dictionary or relevant sources.

PARAMETER SCORING

STEP 2 :
Decide level of merits for each parameter based on compiled data

STEP 3:
Score each parameter based on level of merits

STEP 4:
Multiply the score for each parameter to their respective parameter's weight to generate parameter-weighted scores

DOMAIN SCORING

Step 5:
Sum all the parameter's weighted scores within the respective domain

Step 6:
Multiply the total parameter-weighted scores by their respective domain's weight to generate domain-weighted scores

TOTAL SCORING

Step 7:
Sum all the domain's weighted scores

Step 8:
Repeat for other vaccines and compare based on the hierarchy of score

DISEASE PRIORITY SCORE FOR VACCINE

Value Score

Disclaimer : The accuracy of the MyPRICISE framework score is contingent upon its timing of use, as respondent preferences may change over time. Consequently, the score may vary depending on when the scoring is conducted

MyPRICISE CALCULATION MANUAL

MyPRICISE CALCULATION MANUAL

GUIDELINES FOR CALCULATION

DATA COMPILATION:

Step 1:

Each parameter must be evaluated based on its merit and scored according to available data, as outlined in this manual. The first step involves seeking all data sources listed or recommended or relevant based on the parameters and merits.

Compile this information according to the selected vaccine candidate. In situations where data are not available, the evaluators may consult with experts or stakeholders. Ensure the consultation process is documented as part of the data source.

PARAMETER SCORING:

This process consists of 3 steps:

Step 2. Decide level of merits for each parameter based on the compiled data
Step 3. Score each parameter based on level of merits
Step 4. Multiply the score for each parameter to their respective parameter's weightage

In Step 2, for each of the parameter within a domain, determine their respective level of merits according to available data. Each parameter must be assigned to a merit level.

In MyPRICISE, each of the levels in the merit have been assigned to pre-determined score. These scores are determined following several stakeholder engagements and workshop. These scores differ according to the parameters as they are assigned by field experts from a local perspective and in accordance with the national aspirations.

Each parameter will thus be scored upon the relevant level of merit in Step 3.

Lastly, in Step 4, the score for each parameter should be multiplied by the assigned weightage to generate a parameter weighted score, P_i.

$$P_i = S_i \times W_i \quad (1)$$

Where,

P_i represents the weighted score for parameter i

S_i signifies the score assigned to parameter i

W_i denotes the weightage allocated to parameter i

MyPRICISE CALCULATION MANUAL

DOMAIN SCORING

Upon the completion of the weighted scoring of all the parameter listed within a domain, the evaluators need to generate a weighted domain score.

Step 5 and 6:

The weighted score for each domain (D_i) is computed as the sum of scores for all parameters within the domain, multiplied by the corresponding weightage assigned to that specific domain.

$$D_i = (\sum_{i=1}^{n} P_i) \times X_i \quad (2)$$

Where,

D_i denotes the weighted score for domain i.

P_i represents the weighted score for parameter i

n indicates the number of parameters in domain i

X_i signifies the weightage assigned to domain i

Similar to the parameter weights, domain weights were also determined through Delphi Method, where experts, stakeholders and industry players were required to score the importance of each of the 6 domains listed, out of a total score of 100.

TOTAL SCORING

Step 7:

The total score for the vaccine, denoted as V_i, is calculated as the sum of all the weighted domain scores.

$$V_a = (\sum_{i=1}^{6} D_i) \quad (3)$$

Where,

V_a denotes the scoring for vaccine a.

D_i signifies the weighted score for domain i

Step 8:

The evaluation and scoring process is then repeated to other vaccine candidates. The total vaccine scores can then be used to compare between the candidates. The higher the total score, the more eligible is the vaccine for local development in Malaysia.

INTERPRETATION OF FINDINGS

It is worth highlighting that MyPRICISE determines the priority of vaccines in terms of relativity. Therefore, the selection process is dependent on the vaccine candidates evaluated at the point of time. Newer candidates may alter the ranking and prioritization process.

There are also no specific cut-off points for the total score in determining the priority of the vaccine. Therefore, it is crucial for the scores not to be misinterpreted as good or poor candidate.

Additionally, it is important for the stakeholders and evaluators to understand that the parameter scoring process is dependent on the availability of data. Therefore, it is critical that sufficient efforts are taken into collating the required data. This may include going beyond the resources listed in this manual.

Furthermore, as the availability of data is highly time-dependent, there is a likelihood that evaluations conducted at different time points will generate variable scores. A good practice would be to conduct a re-evaluation process upon the discovery of new evidence.

Example

This exercise will be primarily based on determining the total score for a hypothetical Vaccine A.

DATA COMPILATION

Step 1:

For Domain 1: National Vaccine Policy, there are 3 listed parameters. The first step is to compile all relevant data that would assist in the assignment of merit levels for the vaccine. Let us assume that the present available data for vaccine A is outlined as follows:

- Vaccine A is not listed in the NIP. It is also not currently compulsory by any local law or practice. Additionally, it is also not within the list of vaccines recommended by MOH.
- Vaccine A is recommended by international health agencies. However, it is currently not within the national target for either disease eradication, elimination or control.
- Furthermore, Vaccine A also is recommended for a general healthy population. It is not aimed to protect the vulnerable group from vaccine preventable disease.

PARAMETER SCORING

Step 2:

Based on the information, we will score Vaccine A as below:

Parameters	Merits	Scoring	Evidence
1. Listed in NIP	Listed in NIP	0.1	
	Not listed in NIP but required by local or international law	0.7	
	Not listed in NIP and not required by law but recommended by MOH	0.5	
	Not listed in NIP, not required by law, no recommendation by MOH	0.1	√
1.2 National Target	National target for eradication	1	
	National target for elimination	0.8	
	National target for control	0.6	
	No national target	0.2	√
1.3 Susceptible Groups	Cover at least 3 groups	1	
	Cover at least 1 group	0.6	
	None	0.1	√

Step 3:

Upon determination of the parameter scores, we will need to multiply each of the scores with the pre-determined parameter weights.

Table 1: Domain 1 from My-PRICISE for scoring exercise

Domains	Parameters	Weightage	**Score**
1. National vaccine policy	1.1. Listed in NIP	45.20%	**0.1**
	1.2. National target	29.20%	**0.2**
	1.3. Susceptible groups	25.60%	**0.1**

Step 4:

The score value for parameter 1.1 is as follows:

$P_i = S_i \times W_i$

$P_{1.1} = 0.1 \times 45.20$

$\boldsymbol{P_{1.1} = 4.52}$

The score value for parameter 1.2 is as follows:

$P_i = S_i \times W_i$

$P_{1.2} = 0.2 \times 29.20$

$\boldsymbol{P_{1.2} = 5.84}$

The score value for parameter 1.3 is as follows:

$P_i = S_i \times W_i$

$P_{1.3} = 0.1 \times 25.60$

$\boldsymbol{P_{1.3} = 2.56}$

All parameters will be scored based on the equation (1) and the results are as follows:

The calculation is iterated for all parameters across all domains.

Table 2: Domain 1 from MyPRICISE for weighted-scoring exercise

Domains	Parameters	Scoring	**Weighted Scoring**	**Domain's Weightage**
1. National vaccine policy	1.1. Listed in NIP	0.1	**4.52%**	22.97%
	1.2. National target	0.2	**5.84%**	
	1.3. Susceptible groups	0.1	**2.56%**	

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DOMAIN SCORING

Step 5 and 6

The next step would be to generate a weighted score for Domain 1. This is done by summing the total weighted parameter scores and multiplying the values with the weight for Domain 1.

The weighted scoring for Domain 1 is as follows:

$$D_i = \left(\frac{\sum_{i=1}^{n} P_i}{100}\right) \times X_i$$

$$D\_i = ((4.52 + 5.84 + 2.56)/100) \times 22.97$$

$$\boldsymbol{D_i} = \mathbf{2.97\%}$$

All domains will be subjected to scoring in accordance with Equation (2), yielding the following results:

Domains	Parameters	Scoring	Weighted Scoring	Domain's Weightage	**Weighted scoring**
1. National Vaccine Policy	1.1. Listed in NIP	0.1	4.52%	22.97%	**2.97%**
	1.2. National target	0.2	5.84%		
	1.3. Susceptible groups	0.1	2.56%		
2. Market Attractiveness	[redacted]			19.38%	**10.89%**
3. Vaccine Technology Advancement				15.83%	**10.47%**
4. Economic Consideration				15.08%	**9.12%**
5. Vaccine Ecosystem				13.52%	**9.56%**
6. Vaccine Properties				13.23%	**9.74%**

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TOTAL SCORING

Step 7:

Repeat the process for all domains. The total score for Vaccine A can be computed as follows:

$V_a = \left(\sum_{i=1}^{6} D_i\right)$

$V_a = (2.97 + 10.89 + 10.47 + 9.12 + 9.56 + 9.74)$

$\boldsymbol{V_a = 52.75\%}$

Step 8:

The score for Vaccine A is subsequently compared to that of other vaccines to determine its relative priority. An example is provided as follows:

$$\boldsymbol{V_a = 52.75\%}$$

$$\boldsymbol{V_b = 57.30\%}$$

$$\boldsymbol{V_c = 85.17\%}$$

Therefore, Vaccine C should be prioritized over Vaccines A and B for local development.

MyPRICISE Calculator

MyPRICISE Calculator was developed using Excel to ease the scoring process.

Scan the QR Code below to access the calculator.

NOTES

NOTES

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