TAKSHASHILA INSTITUTION

Vaccine Diplomacy framework for India

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Executive Summary

This document provides a framework to broaden the scope of India's vaccine diplomacy during and after the COVID-19 pandemic. The pandemic has highlighted the inequality of vaccine distribution around the world, giving India the opportunity to step into the vacuum left by traditional global leaders.

This framework can simplify and streamline the interaction of foreign policy and science. It provides another avenue to develop foreign ties through scientific advancement. By looking at the advantages of vaccine diplomacy, the possible methods of aid that India can offer, and the regulations governing the process, India can develop a robust framework for vaccine diplomacy that allows it to extend its influence through novel means.

I. Introduction

The COVID-19 pandemic has made the importance of vaccines apparent. Vaccination is only rivalled by clean drinking water in promoting public health. Developing, maintaining and advancing public health on a global scale is reliant upon, amongst other measures, a robust and equitable vaccination policy. And yet, the New York Times global vaccine tracker shows that as of 27th September 2021, only 0.5% of total administered doses have been given to citizens of low-income countries.[1, 2]

This gap and the protectionist policies followed by many countries has given India an opportunity to extend its soft power to the rest of the world through vaccines. Lower and middle-income countries (LMICs) are reliant upon India's vaccine exports for return to normalcy in the post-COVID-19 world. On its part, India has been engaged in vaccine diplomacy to supply more than sixty countries with COVID-19 vaccines. However, vaccine exports had to be limited, as India tackled a surge in COVID-19 cases in March-June 2021.

Vaccine diplomacy during COVID-19 offers important lessons that can be used in the future. While the Indian government has emphasised the humanitarian aspect of vaccine exports, the scope of vaccine diplomacy can be widened even further. This document aims to look at the extent of that scope, the advantages and disadvantages of using vaccine

diplomacy, the specific forms of aid that India can offer and a regulatory framework for India's vaccine diplomacy.

1. WHAT IS VACCINE DIPLOMACY?

Vaccine diplomacy has no official definition but can be best understood as a subset of science diplomacy. In 2017, the Chief Science Advisor to the Prime Minister of New Zealand, Sir Peter Gluckman,[3] articulated the three branches of science diplomacy. These encompassed:

1) Actions that are designed to advance a country's needs
2) Actions that are designed to address cross-border interests
3) Actions that are designed to meet global challenges

Historically, vaccines have played an important role in foreign policy. Edward Jenner, the inventor of the first smallpox vaccine, interacted directly with Napoleon to release two English scientists from captivity. Despite being at war with the British, Napoleon acquiesced to Jenner's request due to his personal regard for Jenner's vaccine and the number of French lives it had saved.[4] In the 1960s, at the height of the Cold War, the US and USSR worked together to eliminate polio in Hungary through the Sabin-Chumakov vaccine. The vaccine itself was developed through an unprecedented American (Sabin) and Russian (Chumakov) coalition working together to develop a live-attenuated strain of the virus.[5]

Case for India

State-led actions that use vaccines, vaccine expertise and vaccine infrastructure to provide humanitarian aid, generate goodwill and further foreign policy goals constitute vaccine diplomacy.

Vaccine diplomacy from India's perspective could fit into any of the three branches of Science Diplomacy. It can establish India's primacy in the local region by strengthening strained ties. India's role as the world's largest vaccine manufacturer places India in a position to maintain global health standards by distributing vaccines to parts of the world that have not yet received vaccines. In the case of COVID-19 in particular, this will help countries protect their citizens from the severity of symptoms caused by new variants. [6]

India's strength traditionally lies in vaccine production. The Indian government recognised this during the COVID-19 pandemic and began a series of bilateral vaccine donations to neighbouring countries like Nepal and Bhutan as part of its Neighbourhood First Policy,[7] deepening ties with the two countries at a time when Chinese influence in the region was on the rise.

The COVID-19 pandemic also provided an opportunity to reinforce the credibility of India-made vaccines and to showcase India's research capabilities. Various governmental agencies such as the Indian Council of Medical Research (ICMR) and the Department of Biotechnology (DBT) collaborated with private sector companies to fund and expedite vaccine research. By November of 2020, thirty vaccine candidates were in development, with three in clinical trials.[8] By "[rising] to the occasion,"[9] vaccine development and research promoted confidence and investment in India's wider R&D facilities. [10]

II. Importance of vaccine diplomacy

1. Advantages

There are inherent advantages that should compel India to formalise a vaccine diplomacy framework that lasts even beyond the current COVID-19 crisis. Vaccine diplomacy can protect domestic public health, create and cultivate ties between countries and open up new avenues of international interaction. We discuss these advantages below in further detail.

1A. Public health:

Large global human population and rapid urbanisation leading to high-density settlements create conducive situations for rapid spread of infectious diseases, irrespective of the origins of the causative agent. [11]

International travel has also contributed to public health crises. The more the number of travellers, the more likely it is for a virus to be transmitted by a carrier to other individuals on either the journey or the destination. This has increased dramatically over the previous two decades: Between 2000 and 2019, the number of travellers arriving in India alone went from 2.6 to 17.9 million.[12] Novel diseases tend to arise simply due to the nature of viral selection pressure, but international travel ensures that those diseases affect wider swathes of the population than ever before.

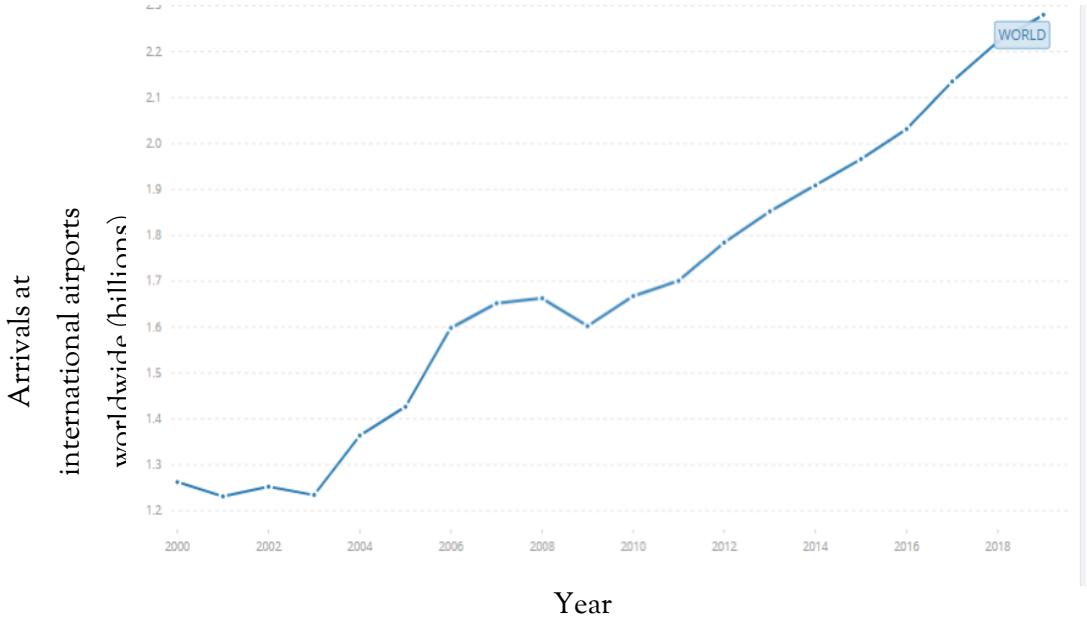


Figure 1: Number of arrivals at international airports worldwide [13]

Both these factors call for the growth of a global consciousness regarding public health. Public health in one region of the world is essential for that in others. With vaccines providing the most obvious and reasonable shield against infectious illnesses, vaccine diplomacy allows governments to extend reasonable safeguards against diseases before they affect the domestic population. Experts are still stating that the COVID-19 pandemic "is not necessarily the big one,"[14] and that a worse crisis might still hit the world. Localising that outbreak, acting efficiently and ensuring it does not spread can mitigate the worst of the public health crisis.

1B. Humanitarian aid:

The humanitarian potential of vaccine diplomacy remains undeniable. India's membership in organisations like UNICEF, WHO and the Global Alliance for Vaccines and Immunisation (GAVI) allow the Indian government to collaborate with other countries to reach the people least likely to have institutional aid.

Article 25 of the Universal Declaration of Human Rights states that "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family,

including [...] medical care."[15] Vaccines are not only for acute crises like the COVID-19 pandemic. Other vaccines - for tuberculosis, diphtheria, pertussis and others - are produced by Indian manufacturers for programmes like the domestic Universal Immunisation Programme.[16] These vaccines represent an avenue for India to directly save lives, confer health and lower the cost of healthcare for the hardest-hit communities in the world.

1C. Economic:

Sending a set of vaccines to other countries can pave the way for opening up those markets for other Indian vaccines, medicines and other healthcare devices. China is currently leveraging this strategy with the UAE. By exchanging vaccine technology with Abu Dhabi, China aims to further relations with UAE.[17]

India can expand into areas of high geopolitical interest by first establishing a vaccine presence in those. Whether that presence encompasses vaccines themselves or more complex objects - like technology or infrastructure building -state intervention can effectively enable economic opportunities for India's private sector.

1D. Foreign policy:

India's foreign policy can be expanded to encompass vaccines as a tool to develop and maintain ties with other countries. Sending direct aid to neighbouring countries, working with South Africa on patent waivers, and cultivating a favourable international reputation all aid in furthering India's foreign policy goals.

India's emphasis on its "Neighbourhood First Policy," has been a key component of Prime Minister Narendra Modi's foreign policy approaches.[13] Under this umbrella, India has sent multiple vaccine shipments to its neighbours like Bangladesh and the Maldives.[7] This has served to not only cultivate better ties with those nations, but also to mitigate the growing Chinese influence that could reduce India's primacy in the Indian subcontinent.[18] [19] Other regions of geopolitical interest to India in Africa and South America can also be approached through the goodwill gesture of vaccines.

This relationship already exists in some form. Since gaining independence, India has represented the interests of LMICs to developed countries. The relationship with countries like South Africa has been built on a bedrock of mutual understanding that the desires of developed countries might not always align with those of developing countries. More recently, India worked with South Africa to obtain a patent waiver from the World Trade Office (WTO) for the COVID-19 vaccines on humanitarian grounds. The waiver was blocked by the United States, the European Union, Canada, the United Kingdom and Australia. Negotiations might begin again at the WTO Ministerial Conference that is tentatively scheduled from 30th November to 3rd December 2021. [20]

Cultivating relationships through vaccine diplomacy in regions of geopolitical importance to India especially in LMICs will enable India to further its international image as well as counter Chinese inroads, especially in African countries.

2. Risks of vaccine diplomacy

Vaccine diplomacy can aid in developing resources, relationships and reputations. However, India must safeguard against certain risks to ensure that the strategy remains beneficial.

2A. Balancing domestic and international needs:

India must balance domestic needs with international exports. This issue is aggravated during situations like a pandemic when supplies are low and domestic demand is high. This has been evident during the COVID-19 pandemic. While this might not be a major criterion for determining vaccine exports during less urgent public health crises, like the measles or pertussis vaccines, the national stores must still be carefully monitored so they can handle a potential outbreak within India. This can best be achieved through effective and centralised policies.

During the COVID-19 pandemic, the Indian government has reacted to vaccine surpluses and shortages by releasing vaccines to other countries or shutting down exports as the situation demands. [7, 21] The need to ensure domestic health outweighs nebulous foreign policy achievements. The key to balancing diplomatic efforts and domestic health is to pre-empt the total requirement and ensure adequate supply of vaccines for both purposes.

Further, these vaccines must be used and not stockpiled for potential future outbreaks. Vaccines have shelf-lives. Once vials are opened, they must be administered within a set time-limit before they become unviable. Ensuring infrastructure development and human training to minimise waste is necessary.

This can best be done through a centralised agency that keeps track of vaccine stores, determines population needs, identifies foreign policy aims and communicates all three effectively. Vaccine distribution is already being done through the central government's Department of Health and Family Welfare (DHFW). [22] Developing more robust communication policies between departments can only help construct a cohesive framework for vaccine diplomacy.

2B. Threats to private operations:

State intervention under vaccine diplomacy can throttle private sector growth. Banning vaccine exports in private markets, as the Indian government did in January 2021 [23] and again in April 2021, [21] can disincentivise manufacturers. Care must be taken to allow private vaccine manufacturing firms to complete their commercial obligations to foreign entities. Commandeering of vaccine supply by a centralised agency to achieve foreign policy objectives will tarnish the reputation of Indian manufacturers.

2C. Foreign competition:

Competition from other countries may thwart India's vaccine diplomacy efforts if there is no defined policy in place. Vaccine diplomacy is a time-sensitive affair; there are only so many people to vaccinate, and only so many countries to offer aid to.

For example, India and China had both competed to establish a vaccine presence in Brazil. India's extensive manufacturing infrastructure allowed the government to sell Brazil their first COVID-19 vaccines,[24] but prior commitments and regional concerns, [25] along with a surge in domestic cases, [26] led to a halt on all vaccine exports for the foreseeable future.[21] This allowed China to step into the vacuum and sell thirty million doses of the Chinese Sinovac vaccine to the Brazilian government.[26]

India's vaccine diplomacy is, therefore, rests upon a platform of domestic manufacturing and research. Domestic needs must be identified and addressed before releasing doses to the international community, but alacrity in locating markets that need the vaccines and a robust policy that keeps international lines open even through moments of crisis are also necessary. Foreign competition can stifle India's vaccine diplomacy if the Indian government does not react quick enough to current events. Soon enough, China will not remain the only other major international seller for COVID-19 vaccines. India must be ready to meet the moment when other manufacturers enter the market.

3. Approaches

There are various approaches to vaccine diplomacy with inherent advantages and disadvantages. India must decide the diplomatic approach(es) best suited to advance its national interest in the context.

3A. Multilateral:

A multilateral diplomatic approach involves multiple countries working together for a single purpose. Examples of multilateral diplomacy include the Association of Southeast Asian Nations (ASEAN), the International Solar Alliance (ISA), and the COVID-19 Vaccines Global Access, better known as COVAX, that was created to distribute affordable COVID-19 vaccines to LMICs.[27] Multilateral approaches allow international experts to work together to achieve a common goal, expanding the scope of humanitarian aid beyond what a single country could achieve alone.

An excellent example of multilateral vaccine diplomacy occurred in early March of 2021 during the Quadrilateral Security Dialogue (Quad meeting). India's pledge to manufacture one billion doses of the Johnson and Johnson vaccine showcased the importance of India's manufacturing capability in ensuring global public health. [28] It also allowed India to solidify its role as the vaccine manufacturer of the world. US funding for the Indian-based vaccine manufacturing company Biological E demonstrated their faith in India's production.[29]

This approach turns advantageous when target countries require extensive international aid, as in a global humanitarian crisis like the Ebola epidemic of 2014, when numerous nations worked together to control the outbreak in West Africa. [30] Though there might be a low gain in terms of reputation for India - because the credit would be shared through the multilateral entity - the international coalition can usually attempt more ambitious projects than India could alone.

3B. Bilateral:

A bilateral diplomatic approach is one that involves only the two countries of interest. It is useful if India wishes to showcase the vaccine expertise and manufacturing ability it brings to the table. The primary use of bilateral diplomacy would be in areas of high geopolitical interest to India like the close neighbourhood,[13] or areas in which India wishes to forge closer ties, like countries in East Africa [31] and South-East Asia.[32]

India's Neighbourhood First Policy along with COVAX has facilitated countries in the region like Nepal, Bhutan and the Maldives to vaccinate 22%, 70% and 68.5% of their respective populations.[33] [34] [35]

This is in stark contrast to Latin America and Eastern Europe, which have "struggled to secure vaccine access outside of COVAX" [36] despite witnessing a recent increase in cases. Three-quarters of India's vaccine donations have gone to countries in South Asia in an attempt to solidify India's strength in the region and mitigate Chinese influence.[37]

III. Methods of aid

1. India's capabilities

India can contribute along four main axes of vaccine development and deployment: manufacturing, research and development, technology transfer and distribution expertise.

1A. Manufacturing:

India's traditional strength lies in manufacturing vaccines. The Serum Institute of India is the world's largest vaccine manufacturer, [38] and India manufactures close to 3 billion vaccines yearly, 2 billion of which are exported. [39] India also contributes to 60% of the vaccines provided through UNICEF. [40]

As a follow-up to the Quad meeting in March 2021, the USA announced financial support to an Indian vaccine manufacturer Biological E to enable it to produce the Johnson & Johnson vaccine. The United States Development Finance Corporation has been roped in to provide the financial capital to Biological E to expand its infrastructure to produce a billion doses by 2022.
[28] [29].

By developing the infrastructure to become the world's largest vaccine exporter,[8] India can offer aid on a scale few other countries can hope to match.

1B. Research:

The Indian government can promote research in vaccines for neglected diseases and other illnesses through increased government grants.

Neglected disease research fills a gap left empty by developed countries in which the disease is not prevalent as well as by the private sector that doesn't find the projected

market size attractive. India could then offer these vaccines to countries affected by these diseases. This will build ties with countries that are currently outside the sphere of influence of India, like in West Africa or South America.[41] India is already doing this: in 2015, Bharat Biotech developed India's first locally made vaccine, a three-dose vaccine for rotavirus. [42]

1C. Technology transfer:

Another avenue to share India's resources with target countries would be to transfer the technology for vaccine development. Technology transfer demonstrably lowers drug prices and increases local access to vaccines, as seen in the Hepatitis B vaccine in the late 1990s that brought the cost of a single vaccine dose down by 94%.[43] More recently, the Serum Institute of India and the biopharmaceutical company Astrazeneca have partnered to bring cost-effective COVID-19 vaccines to the developing world.[44] The Indian government can facilitate such technology transfers, particularly if vaccines have been developed in government-funded institutions.

India should also be looking into the opportunities by developing a larger research sector and transferring that technology alongside direct vaccines. This process has been jump-started by the COVID-19 pandemic. India has more than thirty vaccine candidates with five in advanced trials, but needs government policy and structure to compete with other countries. [8] [45]

The development of vaccines within the country, harnessing not only its manufacturing capability but also its research potential, promotes a more self-sufficient India.. Through vaccine diplomacy, India can then tap that potential to transfer the technology and thereby advance its foreign policy and global goals.

1D. Experience and infrastructure:

India has considerable experience in building and sustaining a routine vaccine deployment programme in the face of a spectrum of geographical and logistical challenges. The Universal Immunisation Programme (UIP) has built an infrastructure within the country that allows even hot, wet and isolated enclaves to access vaccines. [46] [47] This experience and knowledge is perhaps lacking in developed countries, and therefore opens up further avenues for diplomatic forays into LMICs in similar climates.

Extensive infrastructure needs have prevented many developing countries from using the Pfizer and Moderna vaccines. India, too, chose to focus regulatory approval on vaccines that could utilise the existing infrastructure, like the SII vaccine or Bharat Biotech's Covaxin.

India's healthcare workers also have experience in setting up large vaccination drives that reach remote corners of the country via the UIP. The United Nation's (UN) Development Programme is aiming to further bolster the UIP by setting up an Electronic Vaccine Intelligence Network (eVIN). This eVIN, supported by GAVI and the Union Ministry of Health and Family Welfare, currently aims to ensure vaccine equity for all children in India,[48] but can eventually be expanded to encompass the larger population.
India developed and launched a digital platform in the form of an app called CoWIN (COVID Vaccine Intelligence network) in March 2021. [49] This platform is being used to effectively deliver and scale up mechanisms for vaccine distribution. Several countries have expressed interest in this platform and a global conclave on CoWIN was organised by India on 5th July 2021.[50]

2. Examples of India's vaccine diplomacy

India has contributed to both COVID and non-COVID vaccine diplomacy efforts.

2A. Non-COVID-19 vaccines:

Up until the COVID-19 pandemic, India primarily wielded vaccine diplomacy through multilateral institutions like the WHO and GAVI. India considers its role in these international organisations less of a "donor-recipient relationship," and more of a "developmental partnership."[51] This shared empathy can provide the platform for India to establish more expansive interactions with nations.

India's contribution to vaccine distribution through these global multi-lateral agencies may not have been publicly noted, but the humanitarian impact is undeniable.

Organisation	Amount Donated (Lakhs, USD)
South Asian Association for Regional Cooperation (SAARC)	100
United Nations	>10
UNICEF	106

[Table 1: Amount donated by the Government of India to each organization[52] [53] [54]]

2B. COVID-19 vaccines:

India's vaccine diplomacy has expanded widely over the course of the COVID-19 pandemic. India worked with South Africa to introduce a resolution to waive patent rights for the COVID-19 vaccines on humanitarian grounds.[55] Local countries were prioritised for vaccine disbursement through the Neighbourhood First Policy.[13] Brazil received one of the first shipments of the vaccines [41]shipped outside the local area. (A full list of India's COVID-19 vaccine exports is enumerated in Appendix A.) Through vaccine diplomacy, India has found itself playing a larger role on the international stage in both managing and mitigating the global spread of the disease.

2C. Analysis:

India's current forays into vaccine diplomacy have expanded the scope of engagement from multi-lateral actions to more direct, bilateral exchanges. Developing a clear policy emphasising swift, transparent action can help expand the scope and reach of this diplomacy beyond COVID-19.

By coordinating with multiple agencies, India has worked to maintain and improve health measures in countries hit by public health crises. However, multi-lateral actions through entities such as WHO or GAVI can rarely result in direct foreign policy influence, since credit is shared with other countries. This is why India's current focus on bilateral diplomacy or on smaller groups like Quad during the COVID-19 pandemic is important, if the country intends to use vaccine diplomacy to influence foreign policy objectives.

India needs to concentrate on increasing the credibility built through COVID-19's Vaccine Maitri initiative in order to expand its vaccine diplomacy programme.

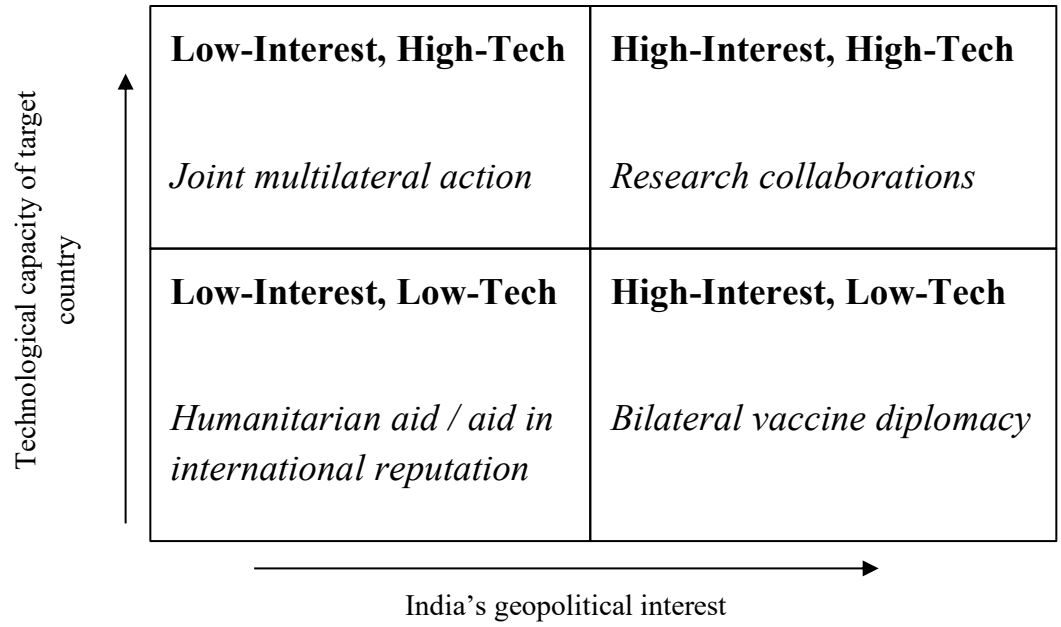
III Frameworks for India's vaccine diplomacy

Vaccine diplomacy involves identification of target countries and the appropriate mechanism of aid. Factors that will influence vaccine diplomacy include technological development, economic status, disease burden and India's geopolitical interest in the target country.

Below we propose analytical frameworks to categorise target countries for vaccine diplomacy and decide on the mechanism of aid:

1. Targeting countries

Vaccine diplomacy may not be the most optimal foreign policy strategy across all countries.



This 2 x 2 matrix aims to identify which countries to target for vaccine diplomacy, as well as the manner in which ties can be established. The X-axis refers to India's geopolitical interest and the Y-axis refers to the technological capacity of the target country.

India's geopolitical interests are a product of many factors, ranging from historical connections to technology transfers in the modern era. India is part of many multinational organisations and has signed strategic agreements with 30 countries and trade blocks.[56] India has been historically relying on Russia and France for technology.[57] [58] While India is not an ally of the USA, US-India relations have been improving over the last decade. India has initiated policies like Act-East, Neighbourhood -First in its traditional sphere of influence. Over the last decade India has been trying to improve ties with African countries

too, by extending line of credit, agro-tech etc. [59] [60] West Asia, specially the Gulf countries, are important due to the presence of a huge diaspora and as a supplier of petroleum.[61]

Technology capacity of the country is defined as its access to technological know-how to research, manufacture and distribute vaccines. For example, a target country may not have manufacturing facilities for the rapid production of a vaccine in response to sudden onset of an infectious disease. The four groups are:

Low-interest, high-tech countries; e.g. Switzerland

These countries are ones in which India has little geopolitical interest but already have extensive development and infrastructure. They are likely prosperous and small countries, with little geopolitical interest to India, like Switzerland or New Zealand. The best method to interact with countries in this bracket is to engage in multilateral action through organisations like GAVI if required.

High-interest, high-tech countries; e.g. the USA

These countries are ones in which India has extensive geopolitical interest and which also have extensive development and infrastructure. They are likely developed countries with established research facilities, such as the United States or the United Kingdom. The best method to interact with countries in this bracket is to engage in both multilateral actions and through long-term projects like research collaborations, whereby India can maintain relations and gain vaccine knowledge.

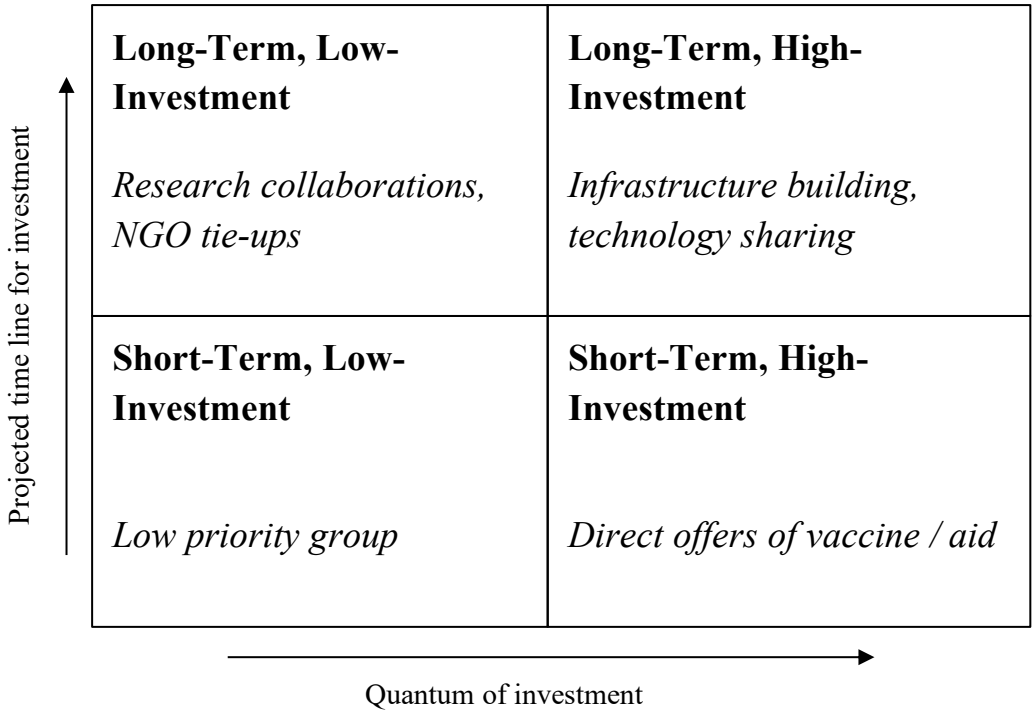
Low-interest, low-tech countries; e.g. Micronesia

These countries are ones in which India has minimal geopolitical interest and which have little native research experience or infrastructure. They are likely to be the target for humanitarian aid, and so multilateral action can aid in ensuring they receive the necessary vaccines, while India's international reputation is enhanced.

High-interest, low-tech countries; e.g. Bangladesh

These countries are the target group for vaccine diplomacy. Their lack of research infrastructure means that India should establish bilateral ties and offer vaccine aid to them directly, thereby deepening the relationship between the two countries. Examples of this group would be Bangladesh or Nepal.

2. Type of vaccine diplomacy



This 2 x 2 matrix aims to determine the kind of aid to be distributed to other countries, based upon the quantum of investment and time period available for aid. The time period for India's investment may be dependent on the severity of the disease, burden on the medical infrastructure in the country of interest, India's foreign policy interest in the

country, etc. The type of aid can vary from direct shipments of vaccines to long-term sharing of trained experts.

Long-term, low-investment

Research collaborations and non-governmental tie-ups can be promoted by the government without extensive funding. Easing visa restrictions, increasing research grants and developing exchange programmes can help develop long-term ties with other countries.

Long-term, high-investment

Some nations invest extensively in other countries over a long period of time, essentially predicting that the region will grow in power in the future. The development of ETH Zurich in Singapore exemplifies this kind of forward-thinking planning.[63]

Short-term, low -investment

This would be a low-priority group for vaccine diplomacy.

Short-term, high-investment

This is the kind of vaccine diplomacy that India is currently engaged in, involving direct exports of high-demand vaccines to countries. It can result in short-term gain but will likely not have a lasting impact. However, this kind of diplomacy is necessary and effective during pandemics, because of the effect that it can have on India's international reputation.

VII. Conclusion

In this paper, we have discussed what vaccine diplomacy encompasses, its advantages and disadvantages and the various kinds of aid that India can offer to the world. We then discussed possible frameworks for India's vaccine diplomacy. As with all kinds of soft power, vaccine diplomacy will not result in swift, equitable returns. The path forward with

vaccine diplomacy remains highly dependent upon unique circumstances, international agreements and private stakeholders.

However, a robust framework for vaccine diplomacy can only help India create, maintain and further international relations. By balancing internal needs with foreign policy objectives, India can open up new avenues of interaction and develop stronger ties. Vaccine diplomacy can help maintain India's primacy in the local region, while simultaneously promoting the image of India as a research and manufacturing giant abroad.

VIII. Appendices

1. Appendix A: Vaccine distribution of India[7]

Made-in-India COVID19 vaccine supplies so far (In lakhs) *(As on 29 May 2021 at 1000 hrs)*

Sl. No.	Country	Grant		Commercial		COVAX		Total Supplies
		Quantity	Date of Despatch	Quantity	Date of Despatch	Quantity	Date of Despatch	
1	Bangladesh	33	(20) 21-Jan-21 (12) 26-March-21 (1) 2-Apr-21	70	50 25-Jan-21 20 22-Feb-21			103
2	Myanmar	17	(15 SII) 22-Jan-21 (2 BB) 11-Feb-21	20	11-Feb-21			37
3	Nepal	11	(10) 21-Jan-21 (1) 28-Mar-21	10	20-Feb-21	3.48	05-Mar-21	24.48
4	Bhutan	5.5	1.5 20-Jan-21 4 21-Mar-21					5.5
5	Maldives	2	1 20-Jan-21 1 19-Feb-21	1	29-Mar-21	0.12	06-Mar-21	3.12
6	Mauritius	1	22-Jan-21	3	(1 SII) 19-Feb-21 (2 BB) 18-Mar-21			4
7	Seychelles	0.5	22-Jan-21					0.5
8	Sri Lanka	5	28-Jan-21	5	24-Feb-21	2.64	06-Mar-21	12.64
9	Bahrain	1	28-Jan-21					1

10	Brazil			40	20 22-Jan-21 20 22-Feb-21			40
11	Morocco			70	20 22-Jan-21 40 11-Feb-21 10 24-Feb-21			70
12	Oman	1	30-Jan-21					1
13	Egypt			0.5	30-Jan-21			0.5
14	Algeria			0.5	31-Jan-21			0.5
15	South Africa			10	31-Jan-21			10
16	Kuwait			2	31-Jan-21			2
17	UAE			2	2-Feb-21			2
18	Afghanistan	5	7-Feb-21			4.68	06-Mar-21	9.68
19	Barbados	1	7-Feb-21					1
20	Dominica	0.7	7-Feb-21					0.7
21	Mexico			8.7	12-Feb-21			8.7
22	Dominican Republic	0.3	18-Feb-21	0.2	14-Feb-21			0.5
23	Saudi Arabia			45	30 14-Feb-21 15 28-Mar-21			45
24	El Salvador			0.2	15-Feb-21			0.2
25	Argentina			5.8	16-Feb-21			5.8
26	Serbia			1.5	20-Feb-21			1.5
27	UN Health workers			1	21-Feb-21			1
28	Mongolia	1.5	21-Feb-21					1.5
29	Ukraine			5	22-Feb-21			5
30	Ghana	0.5	4-Mar-21	0.02	10-Mar-21	6	23-Feb-21	6.52
31	Ivory Coast	0.5	4-Mar-21			5.04	25-Feb-21	5.54
32	St. Lucia	0.25	27-Feb-21					0.25
33	St. Kitts & Nevis	0.2	27-Feb-21					0.2
34	St. Vincent & Grenadines	0.4	27-Feb-21					0.4
35	Suriname	0.5	27-Feb-21					0.5
36	Antigua & Barbuda	0.4	27-Feb-21					0.4
37	DR Congo	0.5	4-Mar-21			17.16	1-Mar-21	17.66
38	Angola					6.24	1-Mar-21	6.24
39	Gambia					0.36	1-Mar-21	0.36

40	Nigeria	1	25-Mar-21			39.24	1-Mar-21	40.24
41	Cambodia					3.24	2-Mar-21	3.24
42	Kenya	1	10-Mar-21			10.20	2-Mar-21	11.20
43	Lesotho					0.36	2-Mar-21	0.36
44	Rwanda	0.5	4-Mar-21			2.40	2-Mar-21	2.9
45	Sao Tome & Principe					0.24	2-Mar-21	0.24
46	Senegal	0.25	4-Mar-21			3.24	2-Mar-21	3.49
47	Guatemala	2	2-Mar-21					2
48	Canada			5.00	2-Mar-21			5.00
49	Mali					3.96	3-Mar-21	3.96
50	Sudan					8.28	3-Mar-21	8.28
51	Liberia					0.96	4-Mar-21	0.96
52	Malawi	0.5	12-Mar-21			3.60	4-Mar-21	4.1
53	Uganda	1.00	7-Mar-21			8.64	4-Mar-21	9.64
54	Nicaragua	2.00	5-Mar-21			1.35	14-Mar-21	3.35
55	Guyana	0.8	5-Mar-21					0.8

56	Jamaica	0.50	5-Mar-21					0.50
57	UK			50	5-Mar-21			50.00
58	Togo					1.56	5-Mar-21	1.56
59	Djibouti					0.24	5-Mar-21	0.24
60	Somalia					3.00	5-Mar-21	3.00
61	Seirra Leone					0.96	6-Mar-21	0.96
62	Belize	0.25	7-Mar-21					0.25
63	Botswana	0.30	7-Mar-21					0.30
64	Mozambique	1.00	7-Mar-21			3.84	7-Mar-21	4.84
65	Ethiopia					21.84	7-Mar-21	21.84
66	Tajikistan					1.92	8-Mar-21	1.92
67	Benin					1.44	8-Mar-21	1.44
68	Eswatini	0.20	9-Mar-21			0.12	11-Mar-21	0.32
69	Bahamas	0.20	10-Mar-21					0.20
70	Cape Verde					0.24	9-Mar-21	0.24
71	Iran			1.25	(BB)10-Mar-21			1.25
72	Uzbekistan					6.60	15-Mar-21	6.60
73	Solomon Islands					0.24	17-Mar-21	0.24
74	Laos					1.32	17-Mar-21	1.32
75	Namibia	0.30	18-Mar-21					0.30
76	Bolivia					2.28	18-Mar-21	2.28
77	South Sudan					1.32	22-Mar-21	1.32
78	Paraguay	2.00	(1 BB) 26-Mar-21 (1 BB) 22-Apr-21					2.00
79	Fiji	1.00	26-Mar-21					1.00
80	UN Peacekeepers	2.00	27-Mar-21					2.00
81	Zimbabwe	0.35	(0.35 BB) 28-Mar-21					0.35
82	Niger	0.25	28-Mar-21			3.55	12-Apr-21	3.80
83	Palestine			0.25	29-Mar-21			0.25
84	Yemen					3.60	29-Mar-21	3.60
85	Nauru	0.10	06-Apr-21					0.10
86	Trinidad & Tobago	0.40	09-Apr-21					0.40
87	Guinea					1.944	10-Apr-21	1.944

88	Papua New Guinea					1.32	10-Apr-21	1.32
89	Guinea Bissau					0.288	10 Apr-21	0.288
90	Zambia					2.280	11 Apr-21	2.280
91	Comoros					0.120	11 Apr-21	0.120
92	Cameroon					3.912	12 Apr-21	3.912
93	Mauritania					0.696	12 Apr-21	0.696
94	Albania	0.50	16-Apr-21					0.500
95	Syria					2.568	16 Apr-21	2.568
	Total	107.15		357.92		198.628		663.698

2. Appendix B: Regulations

2.1 Domestic regulations

Vaccine diplomacy encompasses many different departments within the government. These include:

Department of Science and Technology (DST)
Ministry of External Affairs (MEA)
Ministry of Health and Family Welfare (MoHFW)
Central Drugs Standard Control Organisation (CDSCO)

Domestic regulations:

	Component	Name of Regulation	Ministry in charge	Remarks
Vaccine Research	Clinical Trials		CDSCO	
Ethics	Bioethics	National ethical guidelines for biomedical and health research involving human participants	ICMR	

	Bioethics	New Drugs & Clinical Trials Rules 2019	CDSCO	
Manufacture	GMP practices	Drugs and Cosmetics Act	DCGI	
	Coordination, procurement, evaluation, etc.	COVID-19 Emergency Response and Health Systems Preparedness Project	Ministry of Health and Family Welfare	
	Biomedical waste	Biomedical Waste Management Rules	Ministry of Environment, Forest and Climate Change	Applies to all hazardous microorganisms except for viruses
	Hazardous microorganisms	Rules for the Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms/Genetically Engineered Organisms or Cells	Ministry of Environment, Forest and Climate Change	Does apply to viruses
	Vaccine import/export	Import and export of vaccines in relation to COVID-19 through Courier	Department of Revenue	Central Board of Indirect Taxes & Customs is nominally in charge

DST is involved in vaccine research and development. [62]The CDSCO regulates and approves vaccines. [63]The MoHFW is responsible for distributing those vaccines domestically. The MEA is necessary determining the foreign policy objectives that can be achieved through vaccine diplomacy.

Developing and creating a reasonable way for all these agencies to work together in times of crisis is going to be challenging. The most meaningful way forward would be to create a

board dedicated to coordinating these departments, thereby ensuring that all of them are aware of the others' actions, abilities and priorities.

2.2 International regulations

Three organisations oversee the research, manufacture and transport of vaccines. These organisations - the WHO, the WTO and the WIPO - have broad powers and coalitions. More detailed processes fall under treaties that are overseen by either these organisations or a combination of these organisations, but consist of separate agencies.

2.2A. WHO, WTO and WIPO:

The World Health Organisation (WHO) is involved in international research collaboration, vaccine regulations, certification and shipping. For example, the body interacts with individual national regulatory authorities (NRAs) to provide a global benchmarking tool for the evaluation of medical products. [28] It is also the authority on providing certification for finished pharmaceutical products, [29] guidelines for international packaging and shipping of vaccines,[38] and how to supply manufacturing equipment.[31]

The World Trade Organisation (WTO) is involved in < arbitrating? > international property disputes, regulating exports and imports, expediting the movement of vaccines along supply routes, and sanitary measures.

The WTO's jurisdiction also lies over patent rights, as seen when India and South Africa worked together recently to introduce a WTO proposal to waive patent rights for the COVID-19 vaccines on humanitarian grounds, so as to allow swifter manufacturing for many LMICs. The US, UK, Canada and EU blocked this proposal. Negotiations might begin again at the WTO Ministerial Conference that is tentatively scheduled from 30th November to 3rd December 2021. [20]

The World Intellectual Property Organisation (WIPO) is involved in intellectual property disputes and agreements. Patent rights are usually considered with both WTO and WIPO's oversight.

International regulations:

	Components	Name of Regulation	International Agreement/ Agency	Remarks
Vaccine research	Microorganism transfer	Budapest Treaty		
	Pharmacovigilance	CIOMS		ICMR is a part of CIOMS
	Vaccine regulation	National Regulatory Authority	WHO	This is the global benchmarking tool for evaluating medical products
Ethics	Bioethics	Universal Declaration of Bioethics and Human Rights		India was consulted in the drafting process, but this is a non-legally binding declaration
Intellectual Property	International agreement	TRIPS Agreement	WTO	World's most comprehensive multilateral agreement on intellectual property

	Improving IP laws for LDICs	Doha Agreement	WTO	Reaffirmed the principles of TRIPS in a manner responsive to public health objectives
	Trilateral consensus between the WHO, WTO and WIPO	Standing Committee on the Law of Patents		
	Right to health	ICESCR		Gave the scope and content of the right to the highest attainable standard of health
Import/Export	Pharmaceutical certification	WHO Certification Scheme for Finished Pharmaceutical Products	WHO	
	Vaccine shipping		GAVI	
	Expedited movement	Trade Facilitation Agreement	WTO	
	Export prohibitions	General Agreement on Tariffs and Trade	WTO	Allows for suspension of laws banning exports for critical shortages

	Export prohibitions	Decision on Notification Procedures for Quantitative Restrictions	WTO	Notification to the WTO is done through the QR decision if an export prohibition is placed
	Exports and imports	Technical Barriers to Trade	WTO	Ensures technical regulations, standards and conformity assessment procedures are non-discriminatory and don't create unnecessary obstacles to trade
	Air Travel	Chicago Convention	ICAO	
	Trade	General Agreement on Trade in Services	Uruguay Round Agreement	
Manufacture	GMP practices	Drugs and Cosmetic Act	WHO	Based on WHO guidelines
	Sanitary measures	Agreement on the Application of Sanitary and Phytosanitary Measures	WTO	India is a signatory, but has not yet submitted a notification regarding COVID-19

	Hazardous wastes	Basel Convention		Transboundary movements of hazardous wastes are managed and disposed of in an environmentally sound manner
	Persistent organic pollutants	Stockholm Convention		

2.2B. Other regulations:

Different regulations are responsible for highly specific aspects of facilitating vaccine development and disbursement. These regulations tend to fall under five primary fields that ensure international standards are met and adhered to:

Vaccine development

Domestic approval

Vaccine manufacturing

International distribution

Domestic distribution and surveillance

(For a more comprehensive tabulation on international regulations, see Appendix B)

3. Appendix C: Factors that affect vaccine diplomacy

	Factor	Comparisons

Target country	Demography	Young vs old, male vs female
	Technological capacity	Low vs high
	Economy	Developed vs developing
	Geography	Close vs far, mountainous vs plains, oil-rich vs not
	Healthcare	Public vs private
India	Geopolitical interest	High vs low
	Timeframe of aid offered	Short-term vs long-term
	Amount of money	Extensive vs minimal
Crisis type	Airborne	
	Waterborne	
	Foodborne	
	Contact	
	Acute disease	
	Chronic illness	

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