The search keywords were as follows:

Table 1: Search blocks and Keywords

Search Blocks	Keywords
COVAX Alliance	COVAX
COVID-19 vaccine equity	(COVID 19 vaccine) AND (Equity)
COVID-19 vaccine diplomacy	(COVID 19 vaccine) AND (diplomacy)
COVID-19 vaccine accessibility	(COVID 19 vaccine) AND(Accessibility)
COVID-19 vaccine affordability	(COVID 19 vaccine) AND (affordability)
COVID-19 vaccines in LMICs	(COVID 19 vaccine) AND (LMIC)
Hoarding of COVID-19 vaccines	(COVID 19 vaccine) AND (Hoarding)

Vaccine nationalism	(COVID 19) AND (Nationalism)

SEARCH STRATEGY- DATABASES

Search Blocks	Keywords	PubMed	Scopus	Springer	Embase	Total Results
COVAX	**COVAX**	**48**	**184**	**148**	**95**	**475**
COVID 19 VACCINE-EQUITY	**(COVID 19 vaccine) AND (Equity)**	**271**	**313**	**670**	**180**	**1434**
DIPLOMACY	**(COVID 19 vaccine) AND (diplomacy)**	**19**	**43**	**74**	**31**	**167**
ACCESSIBILITY	**(COVID 19 vaccine) AND (Accessibility),**	**889**	**278**	**787**	**131**	**2085**
AFFORDABILITY	**(COVID 19 vaccine) AND (affordability)**	**199**	**30**	**201**	**31**	**461**
LMIC	**(COVID 19 vaccine) AND (LMIC)**	**12**	**29**	**143**	**21**	**205**
HOARDING	**(COVID 19 vaccine) AND (Hoarding)**	**3**	**8**	**84**	**8**	**103**
NATIONALISM	**(COVID 19)AND (Nationalism)**	**4**	**61**	**123**	**43**	**231**
TOTAL		**1445**	**946**	**2227**	**540**	**4686**

The specific concerns for each of the above-mentioned themes of implementation challenges of COVAX are elaborated and are presented in the tables below:

Table 6: Themes of implementation challenges and specific concerns

Implementation challenges- Themes	**Specific concerns**	**Number of evidence**

Vaccine nationalism	• The COVAX facility failed to secure sufficient participation due to vaccine nationalism.	2
	• Bilateral deals end up crowding up global vaccine supply leaving less supply for COVAX and undermining COVAX purchasing power.	17
	• Booster doses administration by HICs	2
	• More funding to national programs than COVAX. Eg, Operation Warp Speed by the USA.	1
	• Before the first vaccine received US FDA Authorization, more than half of the premarket purchase commitments were reserved by HICs.	2

Lack of funding and participation of HICs to COVAX	• Less funding to the COVAX facility than required. • Three dozen countries bypassed COVAX and made huge deals with manufacturers. So not enough SFCs joined to give the collective buying power expected by COVAX. • The USA under the Trump administration didn't join COVAX which resulted in an initial lack of funding.	5 4 1
Limited manufacturing capacity	• the Limited number of manufacturing facilities in the world that too predominantly in the Global North. • Less manufacturing capacity in LMICs.	4 1
Export restrictions	• Export restrictions hinder the free flow of vaccines. • USA invoked the Defense production Act which reduces	6 1

	the active pharma ingredient for AZ manufacture.	
Dependency on AZ vaccine	• The second wave in India caused reallocation of vaccines from SII to domestic usage and COVAX faced a shortfall of 190 million doses in June-July 2021.	2
Lack of technology transfer	• Limited knowledge sharing from Vaccine manufacturers.	2
Lack of transparency	• Lack of transparency in manufacturing order books of Pharma companies as COVAX faced delays and pushed to the end of the queue.	6
Dose sharing problems	• delayed delivery of vaccines to COVAX. • Donations earmarked • Vaccine donations faced logistical challenges- For example, Pfizer requires UCC	1 1 1

	which is not vastly available in LMICs or LICs.	

These gaps are elaborated with specific concerns in the following table

Table: COVAX framework gaps and specific concerns

Framework gaps	**Specific concerns**	**Number of evidence**
Violation of the principle of equity	Allocation cap for HIC is up to 50% of the population while for AMC it is 20%.	4
Aid financing approach for LMICs	LMICs at the mercy of HICs	4
	COVAX FW was based on philanthropy and the will of wealthier nations that will not lead to equitable and fair access to vaccines.	2

Donation dependence	From a self procuring facility, COVAX was reduced to donation dependent platform	4
Allowed bilateral deals for members	All the HICs did bilateral deals outside COVAX	6
COVAX AMC	As an approach to bypass IPR	1
Lack of transparency	No contract details of AMC APAs	1
	No transparency in negotiations with pharma companies	1
IP issues not addressed	COVAX paid pharma companies from public money.	4
	Supported technology transfer than IP waiver	2
Contractual obligations	COVAX allocated vaccine supply to HICs despite the shortage.	2
Lack of representation for LMICs	81 % of HIC representation in COVAX governing bodies	1

Lack of coordination	CEPI was unable to secure the access provisions to ensure equitable global supply of vaccines despite investment.	1

The above-mentioned themes are elaborated in the following table:

Table: Global health policy gaps and specific concerns

Policy gap Themes	**Specific concerns**	**Number of evidence**

Problems of WHO PAS	• Proportional allocation does not meet WHO's own ethical principles for vaccine allocation-1 Proportional allocation by WHO ignores needs-based considerations.	3
	• Different regions and countries have different vaccination targets. Also, the WHO vaccine coverage target is different from the COVAX supply targets.	2
	• The logic of COVAX allocation- no country should vaccinate more than 20% of its population until all countries have vaccinated 20% of the population. Is it even possible that HICs will agree to this?	2
	• Aims to allocate doses for 20% of the population which is far less to achieve herd immunity.	3

Lack of internationally binding agreements	• No enforcement of international cooperation by capping the bilateral deals.	5
	• No international treaty to prevent vaccine hoarding.	1
	• No international treaties specify rights and obligations in the context of global public goods.	1
	• No international treaty agreed to all WHO members for COVID-19 vaccines.	2

No IPR TRIPS waiver	• lack of global consensus to tackle IPR issues	1
	• COVAX AMC as a way to bypass the IPR issues.	1
	• COVAX framework supports more for technological transfer/sharing rather than the waiver of IPR	1
	• No waiver/suspension of IPR in WTO	5
	• Vaccine nationalism and IPR gives the flawed view of Global Health and Global economy where vaccines and medications are treated as market commodities rather than public goods.	4
	• IPR on COVID-19 vaccines was unfair as it was mostly funded by taxpayers' money. Lack of waiver of IPR obstructs the timely access to affordable vaccines.	1
	• The discrepancy between the vision of supporting COVID-19 vaccines as public goods Vs the reality of access of LMIC to patented technology and relevant knowledge.	1

	• TRIPS is one of the major barriers to health care equity.IPR patenting is the major obstacle for developing countries' vaccine manufacturers to enter the market.	1
	• Pandemic profiteering based on the free market,profit-driven enterprise, and IPR protection is a human rights violation.	1
	• Patent holders determine the global supply chain of COVID-19 vaccines.	1
	• COVAX weakened by IPR. IP rules of TRIPS agreements made it difficult to achieve international cooperation.	2

Global health governance gaps	• Lack of transparency in negotiation with pharma industries	2
	• Contractual impediments by pharma companies against donation and sharing of vaccines.	1
	• Paying pharma companies from public funds instead of sufficient technology sharing and local manufacturing.	1
	• Do pharma corporations have public accountability for deciding which countries get vaccines first?. COVID-19 Vaccine deals are not transparent.	1
	• Power rests with a few pharma companies controlling the supply and distribution of vaccines. Companies decide how to prioritize supply between nations.	2
	• Current global health architecture and existing regulations are inefficient to safeguard equity.	1
	• No mechanisms for Vaccine price controls or regulations that would cap or set the prices.	

		1