



17th TechNet Conference

Panama City, Panama | October 16-19, 2023

Immunization Programmes That Leave No One Behind

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Local Manufacturing

Murat Hakan Öztürk, PAHO Revolving Fund For Access To Vaccines

Nico Vandaele, Access-To-Medicines Research Centre, KU Leuven

Catherine Decouttere, Access-To-Medicines Research Centre, KU Leuven

October 18, 2023



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Removing Financial Barriers for Local Manufacturing in Developing Countries

Murat Hakan Öztürk, PAHO Revolving Fund For Access To Vaccines

October 18, 2023

KEY MESSAGE

Financial sustainability of local manufacturing is mainly based on reliability, accuracy and sustainability of demand of the National Immunization Programmes

A recent analysis showed that countries would have paid at least **75% more for the 13* most used routine vaccines in the region**

47 vaccine products



29



Injection devices & cold chain equipment products

38 Providers



41

Countries and Territories of Latin America and the Caribbean

Over

95%

of vaccines procured are covered by national funding

75 million

vaccinated by the National Immunization Programs annually.



Total PAHO RF Credit Line of more than

\$270 Million

Dec 2022 (for 60 days credit line)

\$900

Million

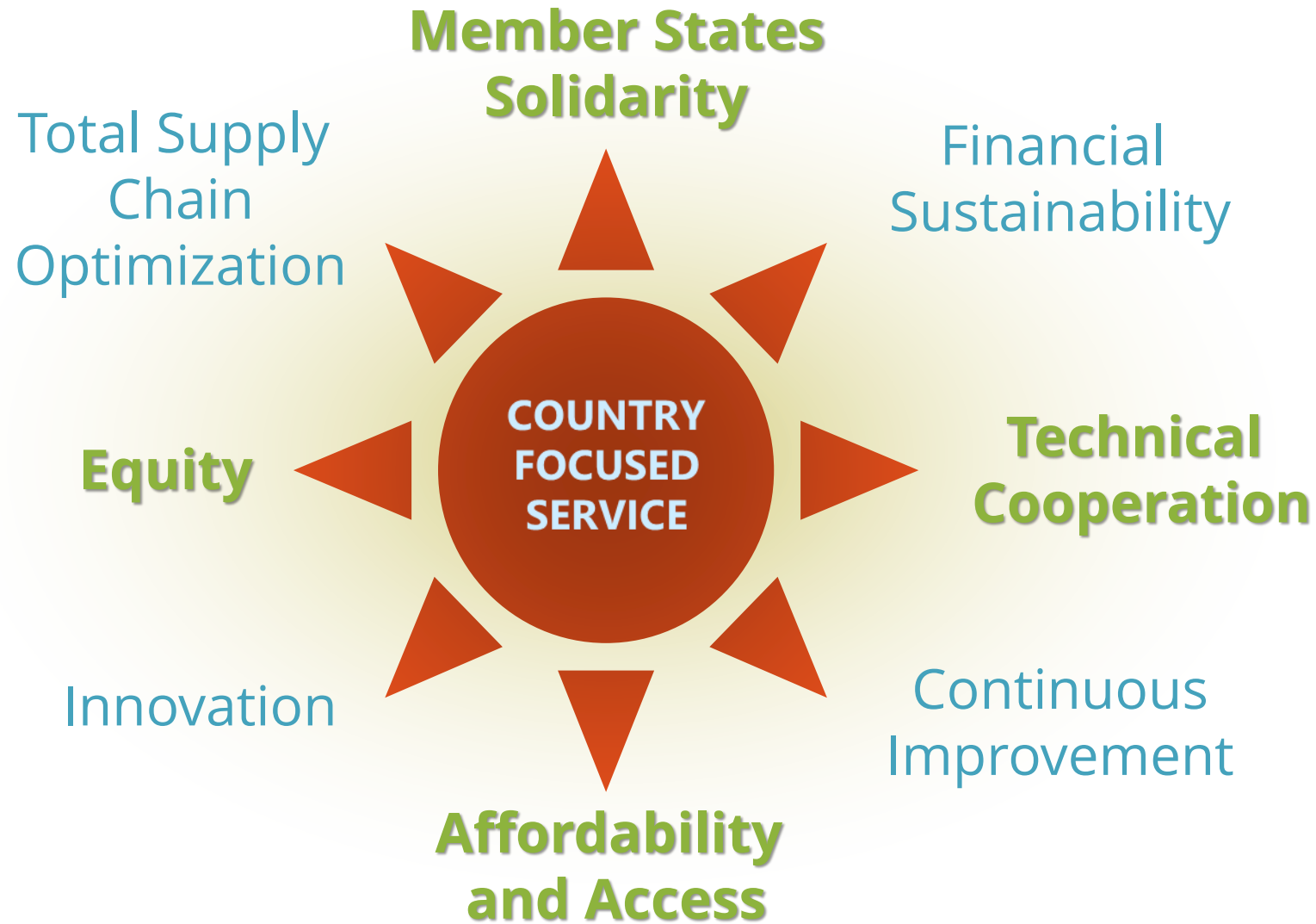
procured in 2022

PAHO



PAHO Revolving Fund Principles

History and Future



EXPAND-(ING)-ED IMMUNIZATION PROGRAMS

Since 1980s, EPIs are challenged to:

- ✓ provide protection against 3 times as many diseases;
- ✓ increase target age ranges from infants to adults;
- ✓ administer 3 times as many doses per person;
- ✓ increase 8-fold the spending on vaccines to fully immunize one person;

To support expansion of national EPIs, the PAHO Revolving Fund is also expanding

Comparison of the cost* to fully vaccinate a child with different vaccine combinations

Combination	Price per combination (US\$)		Percent Increase
	2002	2003	
A BCG (1), Pentavalent (3), MMR (1), OPV(3)**	12.80	13.32	4.06%

2003:

4 basic products in the schedule

Total of 18 products in the RF Catalogue.

Source: EPI Newsletter, Volume XXV, Number 2. April 2003

2003 Prices for Vaccine purchased through the PAHO Revolving Fund

Vaccine	Doses per vial	Prices per Dose FOB US\$
BCG	10	0.1167
DPT	10	0.0905
DT (Adult)	10	0.0490
DT (Pediatric)	10	0.0650
DPT Hib Lyophilized	1	3.0000
DPT Hib Liquid	10	2.5000
DPT/HEP B/Hib	1	3.7600
Hib Lyophilized	1	2.9200
HEP B 10 MCG recombinant pediatric	1	0.5200
HEP B 20 MCG recombinant	1	0.7200
	10	0.2900
Measles (Edmonston)	1	0.8000
	10	0.1200
Measles Rubella	1	1.1000
	2	0.8000
	10	0.4800
Measles/Mumps (URABE) Rubella=MMR	1	1.4900
	10	1.1154
Polio (Glass Vial)	1	0.1400
	10	0.1350
	10	0.1430
Polio (Plastic Vial)	20	0.1350
	25	0.1300
	10	0.1430
Rabies Human Inactivated Purified Vero Cell	1	8.5000
TT	10	0.0400
Yellow Fever	5	0.5300
	20	0.8000

Immunization Newsletter



Volume XLV | Number 2 | June 2023

Prices for Vaccines Purchased through the PAHO Revolving Fund, 2023 (prices in US\$)^a

Vaccine	Doses per vial	Average cost per dose ^a	Vaccine	Doses per vial	Average cost per dose ^a		
BCG	(≥1 year - 0.1 mL injection) (lyophilized) India origin ^b	10	\$0.3300	Measles/mumps (Zagreb strain)/rubella	1	\$3.5600	
	(<1 year - 0.05 mL injection) (lyophilized) India origin ^b	20	\$0.1650		5	\$1.7760	
	(≥1 year - 0.1 mL injection) (lyophilized) Denmark origin ^b	10	\$0.5800		10	\$1.7090	
	(<1 year - 0.05 mL injection) (lyophilized) Denmark origin ^b	20	\$0.2900	Meningococcal ACYW135	1	\$20.3000	
Bivalent oral polio (bOPV)		10	\$0.1994	Pneumococcal conjugate	10-valent (PCV-10) (Belgium origin)	1	\$11.7600
		20	\$0.1288		10-valent (PCV-10) (India origin)	1	\$2.9000
Cholera (oral)	1	\$2.0100	10-valent (PCV-10) (India origin)	5	\$2.0000		
DTP	10	\$0.1819	Pneumococcal polysaccharide	23-valent	1	\$9.4400	
DT	10	\$0.1750	Rabies human use (vero cells)	Vial or pre-filled syringe	1	\$9.3886	
DTaP triple acellular	1	\$18.2000	Rotavirus, liquid	2-dose immunization schedule	1	\$6.5000	
DTaP-IPV	Pre-filled syringe (France origin)	1	\$13.4900	3-dose immunization schedule	1	\$0.9500	
	Pre-filled syringe (Belgium origin)	1	\$16.0000	Seasonal influenza trivalent southern hemisphere 2023	(≥3 years) South Korea origin (pre-filled syringe)	1	\$3.4500
DTaP-IPV-Hib	Pre-filled syringe (France origin)	1	\$17.6100		(≥3 years) South Korea origin	10	\$2.7700
	Pre-filled syringe (Belgium origin)	1	\$19.0000		(6–35 months) South Korea origin	20	\$1.3850
DTP-IPV-Hep B-Hib	1	\$1.1875	(≥3 years) Argentina origin (pre-filled syringe)		1	\$3.7000	
DTP-Hib	Lyophilized	1	\$3.1000		(≥3 years) Brazil origin	10	\$2.9700
DTaP-IPV-Hep B-Hib	Liquid	1	\$21.5400		(6–35 months) Brazil origin	20	\$1.4850
	Lyophilized	1	\$20.0000	Seasonal influenza quadrivalent southern hemisphere 2023	(≥6 months) South Korea origin	1	\$5.3000
Hepatitis A	Pediatric	1	\$8.0280		(≥6 months) South Korea origin	10	\$4.6000
	Adult (China origin)	1	\$10.9900		(≥6 months) France origin (pre-filled syringe)	1	\$5.0000
Hepatitis A	Adult (USA origin)	1	\$13.5000	(≥6 months) France origin	10	\$4.5000	
	Adult	10	\$0.3250	Td	10	\$0.1204	
Hepatitis B	Adult	1	\$0.7849	Tdap	1	\$11.2215	
	Pediatric	1	\$0.5480	Typoid (conjugated)	5	\$5.0000	
Hib	Lyophilized	1	\$2.2500	Varicella	Oka strain - USA origin	1	\$18.4800
	Inactivated polio (IPV)	Netherlands origin	5		\$1.7000	Oka strain - South Korea origin	1
Denmark origin		5	\$1.8500		MAV/06 strain	1	\$12.5000
Inactivated polio (IPV)	Sabin (South Korea origin)	5	\$1.2500	Yellow fever	Brazil origin	10	\$1.2800
	Measles/rubella		1		\$3.0000	France origin	10
		10	\$0.8082				
Measles/mumps (Jeryl Lynn strain)/rubella	1	\$5.3954					

Source: <https://www.paho.org/en/documents/paho-revolving-fund-vaccine-prices-2023>

^a This list contains commonly used abbreviations, rather than actual full technical names and descriptions. In case anything needs to be clarified or you have any questions, please contact RFV@paho.org.
^b These are indicative free-carrier prices (FCA) for planning purposes and do not include international logistics, insurance, and other operating costs. The actual price and other relevant costs will be reported in the procurement documents, such as price estimates.
^c Note that these represent the same vials of BCG products with a volume of 1 mL. The suggested volume per dose to be administered (either 0.05 mL or 0.1 mL) depends on the age group.

PAHO REVOLVING FUND FOR ACCESS TO VACCINES SYRINGES PRICES FOR THE CALENDAR YEAR 2023

#	PRODUCTS (1)	PACKAGING	INDICATIVE PRICE PER PIECE USD (2)
1	AD Syringe with attached needle – 0.5ml 22G x 1 1/2" China Origin	3,000/Case	\$0.0280
2	AD Syringe with attached needle – 0.5ml 22G x 1 1/2" India Origin	2,000/Case	\$0.0351
3	AD Syringe with attached needle – 0.5ml 22G x 1 1/2" UAE Origin	3,000/Case	\$0.0480
4	AD Syringe with attached needle – 0.5ml 23G x 1" China Origin	3,000/Case	\$0.0280
5	AD Syringe with attached needle – 0.5ml 23G x 1" China Origin	3,000/Case	\$0.0340
6	AD Syringe with attached needle – 0.5ml 23G x 1" India Origin	2,000/Case	\$0.0351
7	AD Syringe with attached needle – 0.5ml 23G x 1" UAE Origin	3,000/Case	\$0.0380
8	AD Syringe with attached needle – 0.5ml 25G x 5/8" China Origin	3,000/Case	\$0.0280

PAHO REVOLVING FUND FOR ACCESS TO VACCINES IMMUNOGLOBULINS AND TUBERCULIN TEST PRICES FOR THE CALENDAR YEAR 2023

Item No.	IMMUNOGLOBULINS (1)	PRESENTATION	INDICATIVE PRICE USD (Per Unit) (2)
1	Diphtheria Antitoxin Serum	Vial 10,000 IU	\$72.00
2	Hepatitis B Immunoglobulin - Germany Origin	Pre-filled Syringe 1ml (200 IU)	\$18.17
3	Hepatitis B Immunoglobulin - South Korea Origin	Vial 1 ml (200 IU)	\$19.40
4	Hepatitis B Immunoglobulin - Italy Origin	Vial 1 ml (180 IU)	\$17.50
5	Rabies Immunoglobulin - Germany Origin	Pre-filled Syringe 2 ml (300 IU)	\$33.00
6	Rabies Immunoglobulin - Israel O	Vial	
7	Tetanus Immunoglobulin - Italy Or		
8	Tetanus Immunoglobulin - South I		
9	Anti Varicella-Zoster Immunoglob		
10	Tuberculine PPD RT 23 (2TU/0.1		
11	Tuberculine PPD (5TU/0.1 ml) - E		
12	Tuberculine PPD (5TU/0.1 ml) - F		

#	
1	C
2	C
3	C
4	C
5	C
6	C
7	C
8	C
9	C
10	C
11	C
12	C

(1) Commonly used product abbreviations s questions and clarification needs, please co
 (2) These are indicative FCA prices for plan costs. The actual price and other relevant co

PAHO REVOLVING FUND FOR ACCESS TO VACCINES SAFETY BOXES PRICES FOR THE CALENDAR YEAR 2023

PRODUCT (1)	PACKAGING	INDICATIVE PRICE (per piece) (2)
Safety Box 5L - Finland Origin	25 units/Box	\$0.4450
Safety Box 5L - Sweden Origin	25 units/Box	€ 0.4004

Updated 11 May 2023

(1) Commonly used product abbreviations shown in this list, instead of the actual full technical names and descriptions. In case of any questions and clarification needs, please contact: RFV@paho.org

(2) These are indicative FCA prices for planning purposes and they do not include international logistics, insurance and other operational costs. The actual price and other relevant costs will be clarified in procurement documents like price estimates.

2023:
 13 products in the schedule
 Total of 78 products in the RF Catalogue.



Pooled Procurement Mechanism Dynamics

✓ **Technical support**

Holistic approach for EPI programmatic support
Strengthening immunization supply chains
Regulatory guidance and harmonization
Solidarity and mutual learning

✓ **Procurement planning**

Accurate forecasting
Emergency preparedness & response

✓ **Pooled procurement = Purchasing power**

Value for money – lowest possible prices for all
Economies of scale

✓ **Financial Sustainability**

Financial planning and budgeting
Possible bridge financing



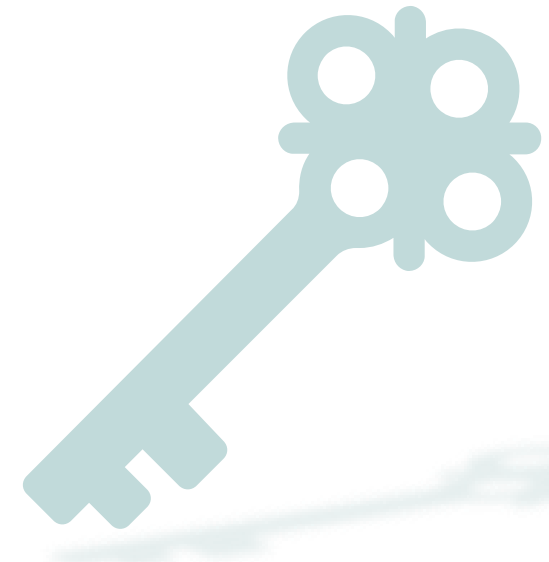
Health and the economy in Latin America: PAHO-ECLAC Reports in 2020 and 2021



- Unprecedented economic challenges
- Health systems are under tension
- Years of health investments and gains to be lost
- Economy cannot recover without controlling the virus
- Access to vaccines and life-saving supplies will be critical
- Countries need extended financial and health support

Revamping and Sustaining Routine Immunization Demand Planning

- 1) NIPs should **reflect recommendations from PAHO Immunization Unit** and national decision making into their vaccine procurement planning.
- 2) Respecting **PAHO Revolving Fund timelines** is critical for overall functioning and regional solidarity.
- 3) NIPs should **keep their PAHO RF credit line accounts clear** without debts to sustain uninterrupted access to critical supplies.
- 4) During post-pandemic transition period, **financial sustainability of NIPs will be critical**. More affordable product choices should be considered under evidence-based and cost-effective decision making.



Vision to Improve Access to Vaccines

Increased National
Production Capacities

Enhanced Demand
Coordination through
Joint Planning

IMPROVED
ACCESS

Stronger Regional
Solidarity and Global
Partnerships

Shaping Competitive and
Health Vaccine Markets
for Security and
Affordability

REMEMBERING KEY MESSAGE

Financial sustainability of local manufacturing is mainly based on reliability, accuracy and sustainability of demand of the National Immunization Programmes



Thank You!

*Please don't hesitate to provide
any questions & comments
you might have...*

Murat Hakan Öztürk, ozturkmur@paho.org



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Regional Vaccine Manufacturing Eco-System Modelling

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October 18, 2023

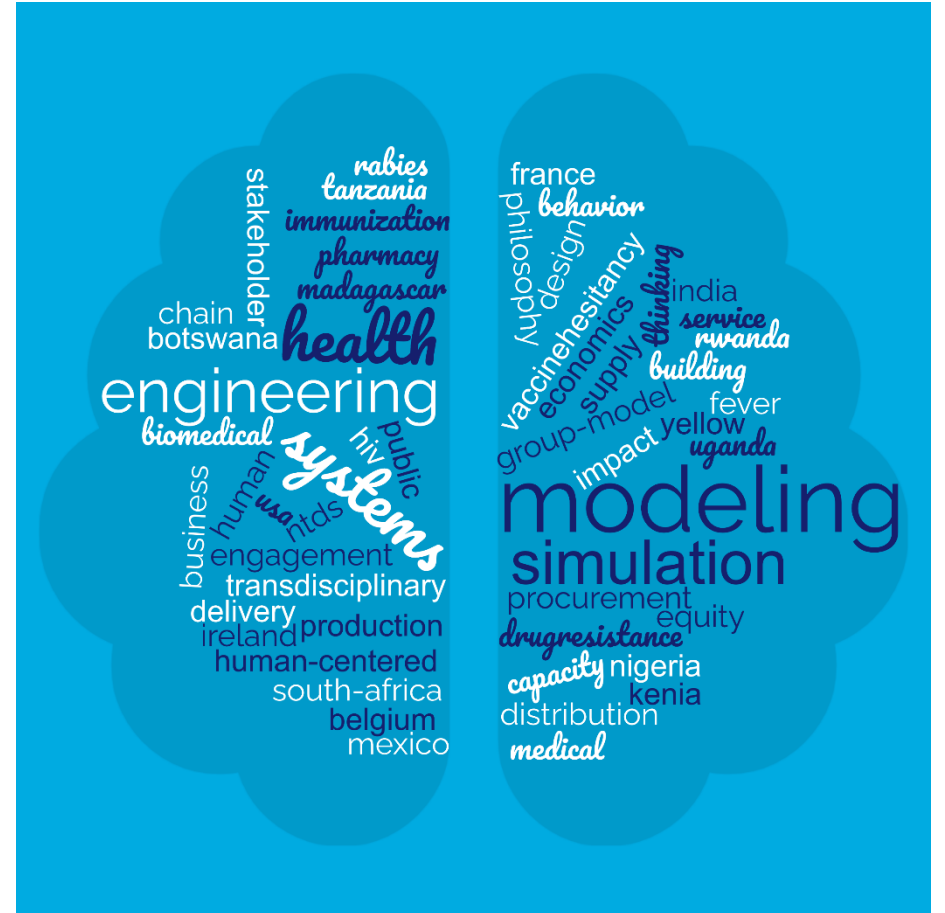
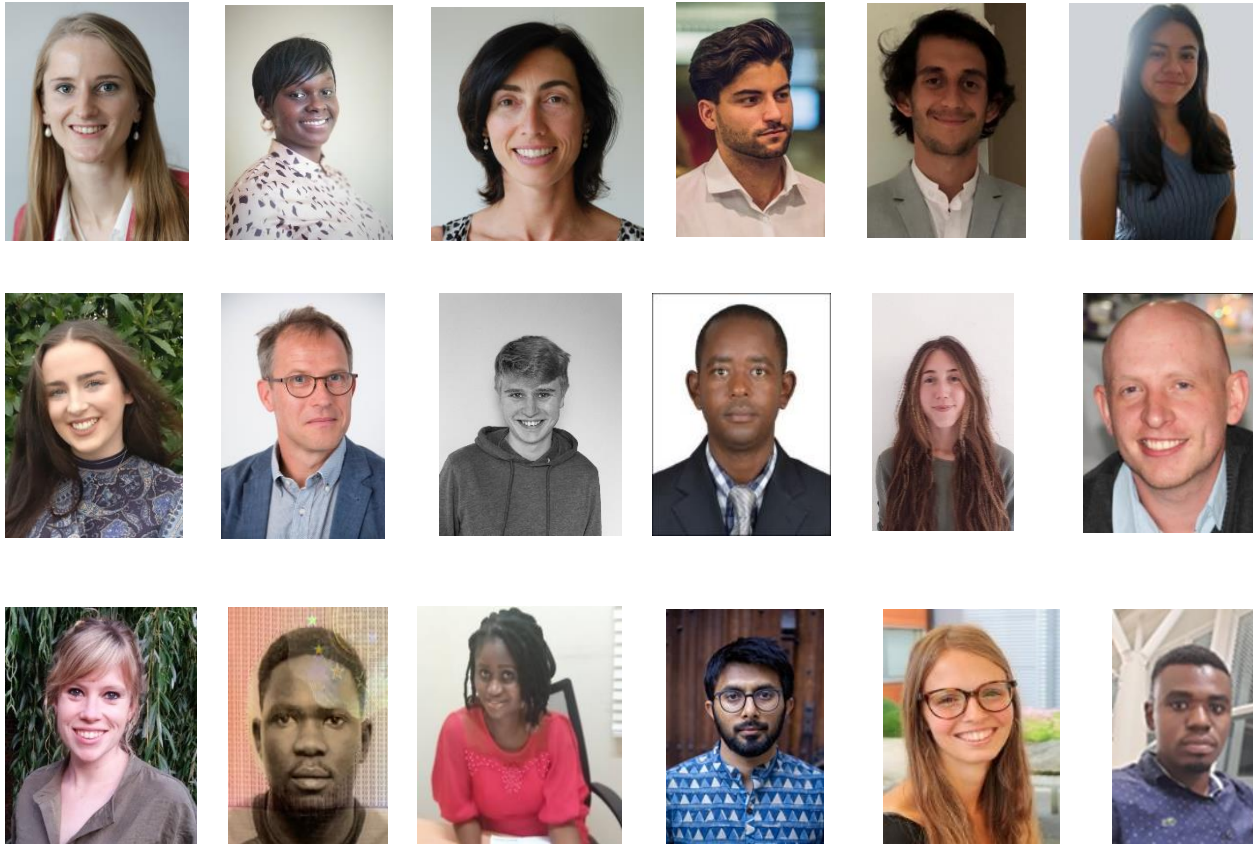


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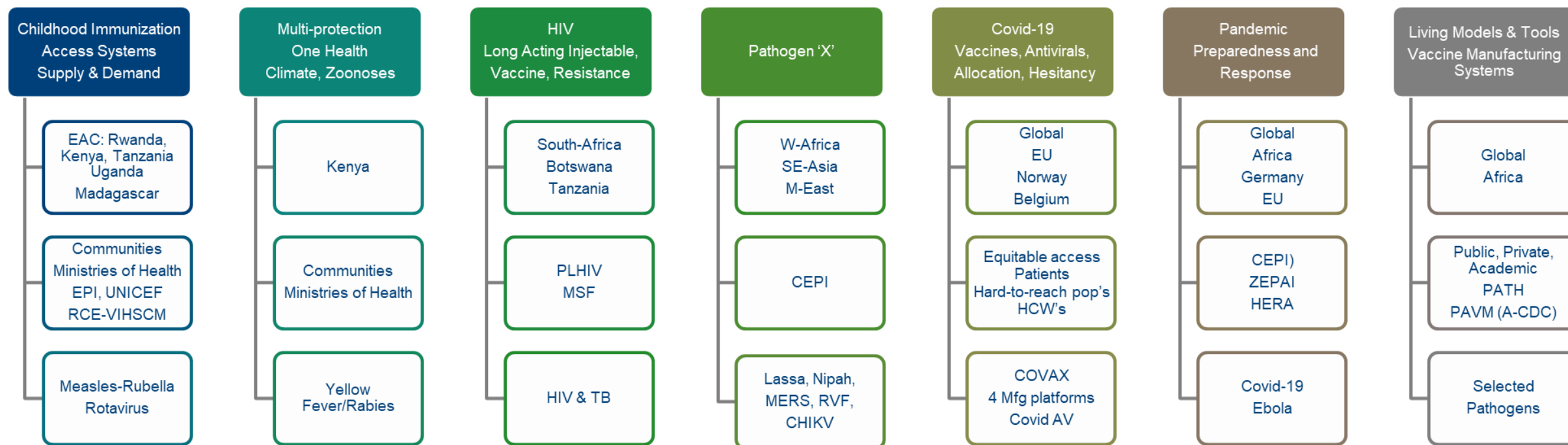
ACCESS-TO-MEDICINES

ATM – Access-to-Medicines Research Centre @ KU Leuven



<https://feb.kuleuven.be/Access-To-Medicines>

Health System Re-Design: Project Portfolio of Access-To-Medicines



Cross cutting:

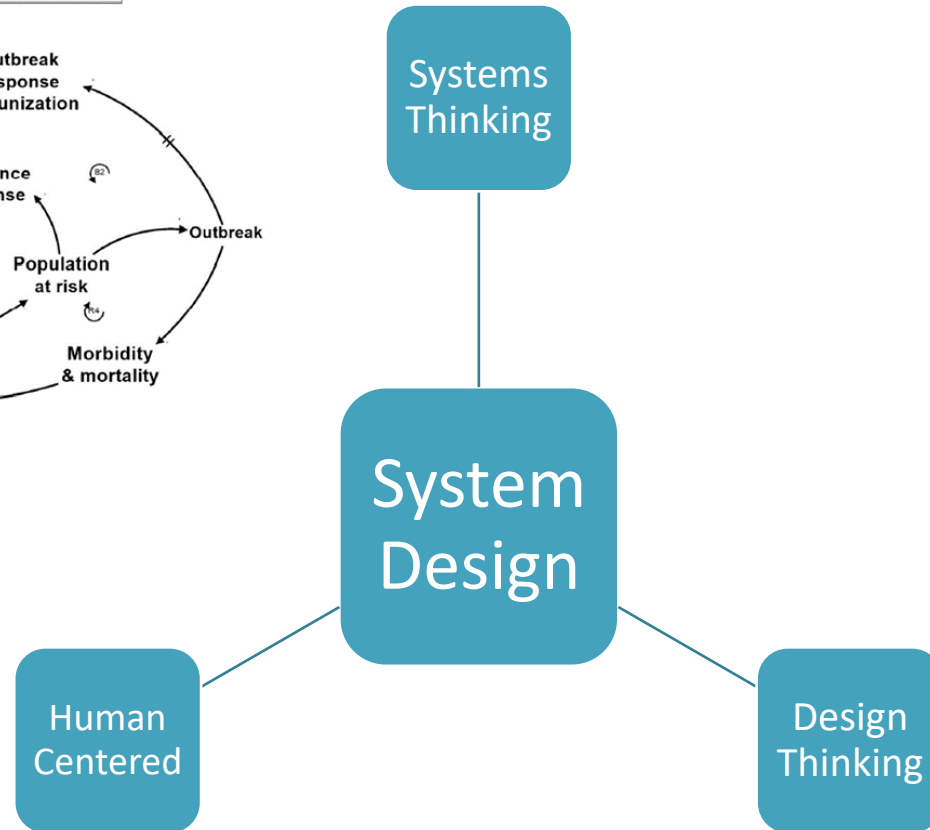
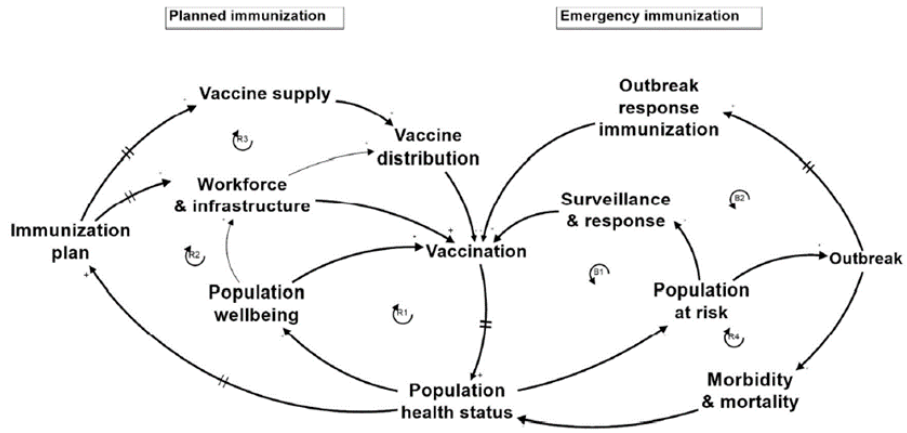
- Human behavior
- Integrated & differentiated care
- Point-of-care & outreaches: vaccines, diagnostics & therapeutics
- Global, regional, national, local/communities



Integrating Multi-Disciplinary Expertise in a Learning and Adaptive European Pandemic Preparedness System

ACCESS-TO-MEDICINES

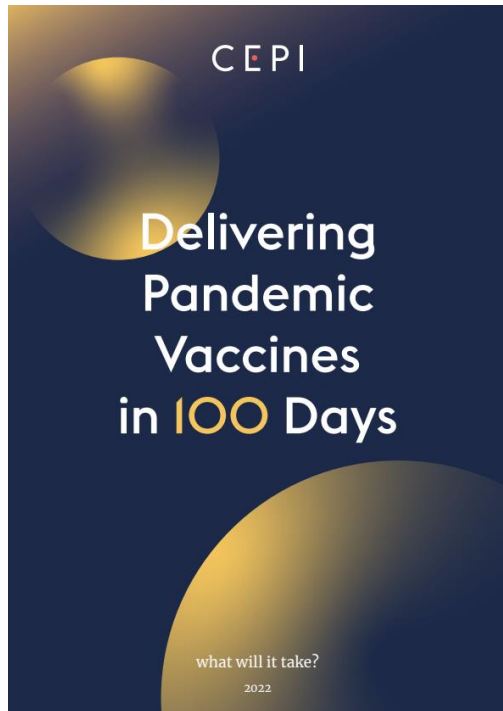
Health System (Re-)Design: Human-Centered Systems Thinking & Design Thinking



1. Stakeholder analysis & SC definition
2. SC KPI's and SC requirements
3. SC design, modeling & scenario generation
4. Scenario ranking
5. Group decision & scenario implementation



Ambitions are High! ... High Hopes! ...How?



Vaccines ***

We bring together public-and-private partners to advance vaccines through every stage of development—from discovery through delivery. We create ingenious technologies and strategies to help countries get the way to the people who need them.



Partnerships for African Vaccine Manufacturing (PAVM) Framework for Action



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“In recognition of the potential impact that earlier, widespread availability of vaccines could have, CEPI has articulated an aspirational goal: vaccines should be ready for initial authorisation and manufacturing at scale within 100 days of recognition of a pandemic pathogen, when appropriate.”*

“The Framework for Action answers the call made by the African Union Commission and the African Centers for Disease Control and Prevention at a summit in April 2021 to develop a framework that will enable Africa to manufacture 60 percent of its vaccine needs locally by 2040. The bold programs it outlines will see Africa become more self-reliant as it addresses its vaccination needs.”**

*<https://100days.cepi.net>; **<https://africacdc.org>; ***<https://www.path.org/solutions/vaccines/>



ACCESS-TO-MEDICINES

ZEPAI

Center for Pandemic Vaccines and Therapeutics

Vaccines are among the most effective tools in the fight against the spread of pathogens. In the early phase of a pandemic, therapeutics can mitigate severe courses of a pandemic infectious disease. Preparing optimally for future pandemics, the German Federal Ministry of Health (Bundesministerium für Gesundheit, **BMG**) has established the Center for Pandemic Vaccines and Therapeutics - **ZEPAI** - at the Paul-Ehrlich-Institut (**PEI**). Professor **Dr. Isabelle Bekeredjian-Ding** has been appointed acting director. Her deputy is **Dr. Joachim Bug**, Head of Production.



Vision

Limit pandemic damage by establishing a framework for making pandemic vaccines available as fast as possible.

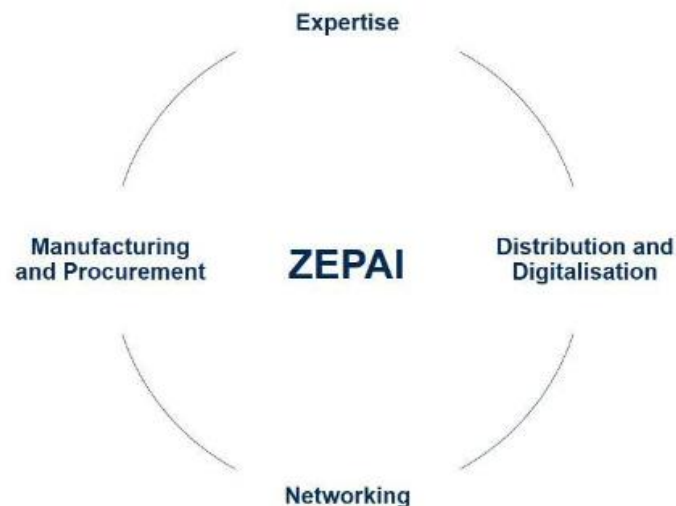
Manufacturing is Necessary, but not Sufficient!

ZEPAI – Fields of Action

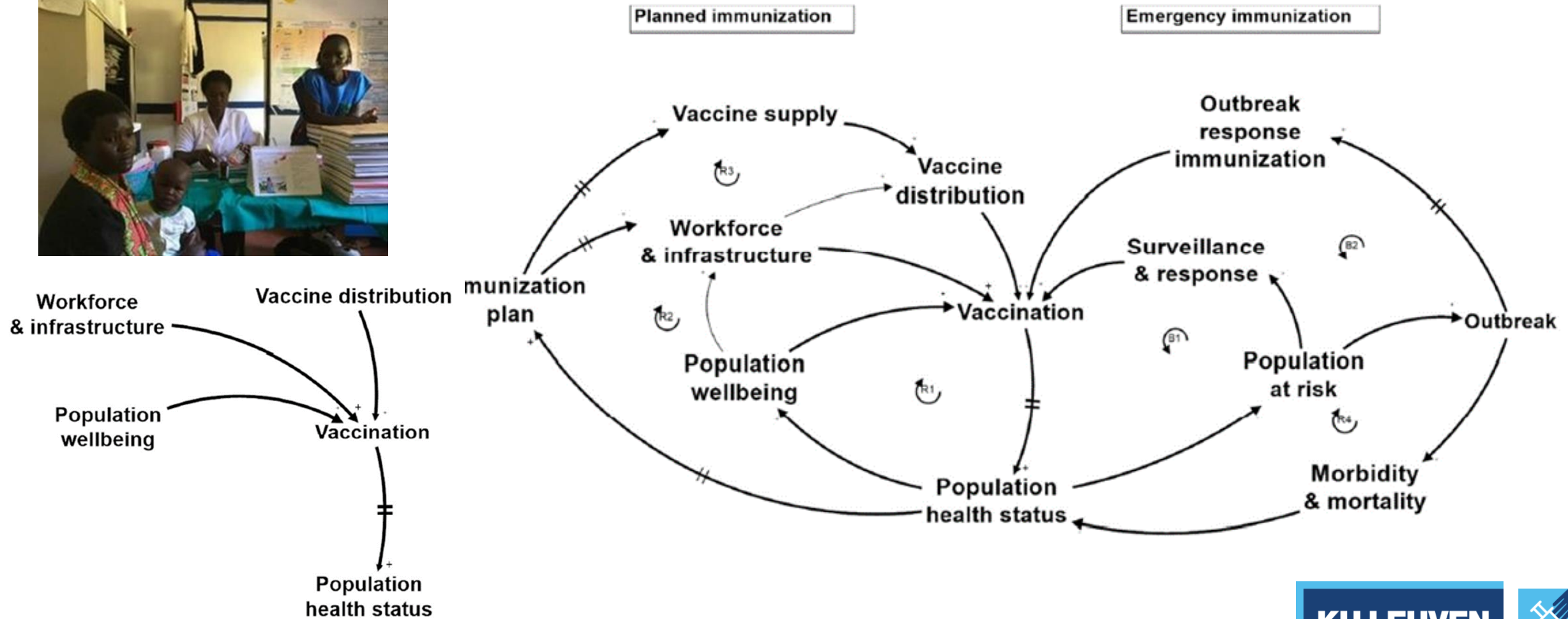
The COVID-19 pandemic has shown that pandemic preparedness and response require coordinated and strategic efforts. From the outset, it is crucial to monitor, steer, and proactively support the implementation of such complex processes.

In order to be prepared and ready to act during future pandemics with respect to personnel, expertise, and technology, **ZEPAI** establishes an interdisciplinary pool of experts. The team will consist of representatives from various disciplines, including drug manufacturing, logistics, infectiology, law, communication and public health services.

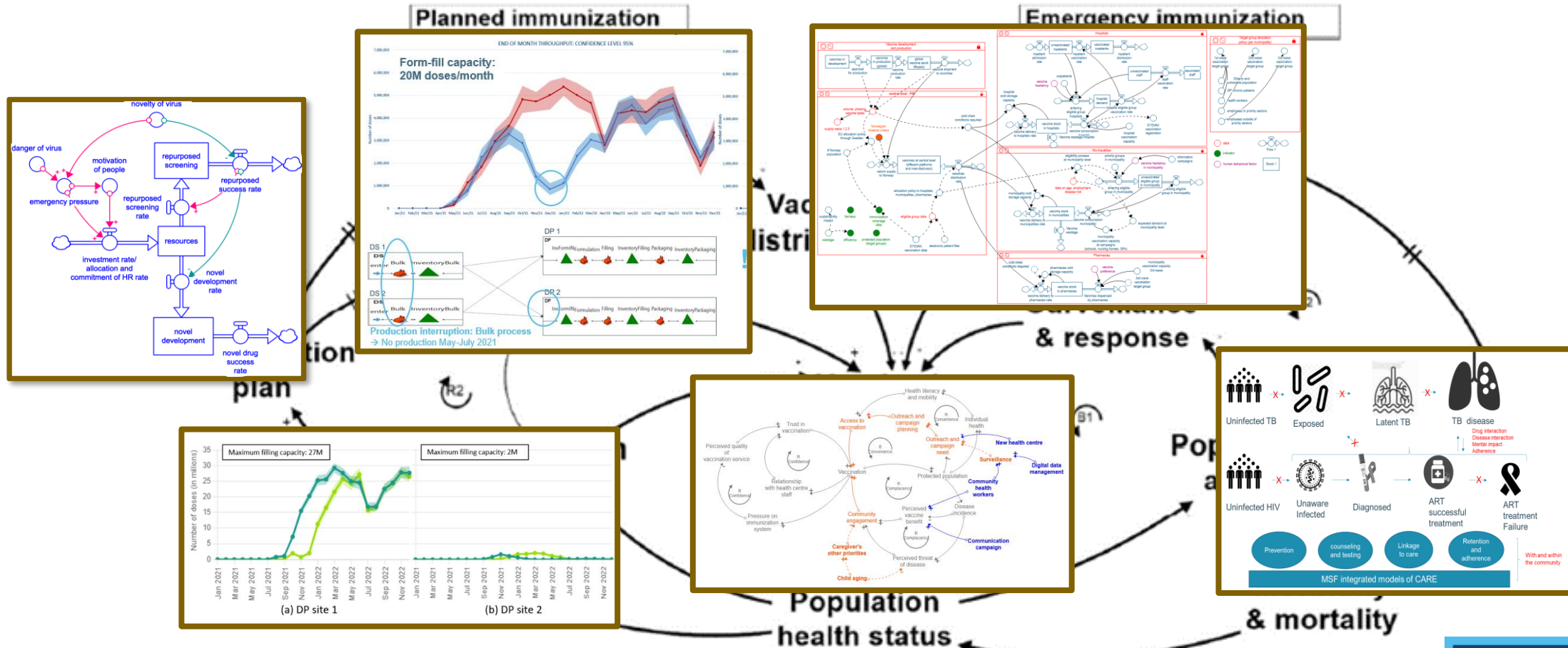
ZEPAI's work focuses on four central fields of action:



Access-To-Medicines Research Centre: Access to Vaccines in a Systems' Nutshell



Subsystem Modeling Methods for Decision Support



Catherine, Decouttere, Stany Banzimana, Pal Davidsen, Carla Van Riet, Corinne, Vandermeulen, Elizabeth Mason, Mohammad S. Jalali, Nico Vandaele, 'Insights into Vaccine Hesitancy from Systems Thinking, Rwanda', *Bulletin of the World Health Organization*, 99(11), 783-794, 2021. <http://dx.doi.org/10.2471/BLT.20.285258>

Thank You!

Regional Vaccine Manufacturing Eco-System Modelling

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Q & A



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Thank You!

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