

## COVID-19 vaccine (in)equity Pandemic complexity through a phenomenological and systems thinking lens

### Background

**Unequitable vaccine coverage**  
 COVID-19 vaccine coverage (April 2021 – April 2022, Fig 1):  
**8.7% to 72.4%** in high-income countries  
**0% to 10.6%** in low-income countries  
 Contributing to large socio-economic costs and slow recovery.

**Wicked problems**  
 'Wicked problems' (e.g., vaccine inequity) have **no straightforward policy response** that would adequately address their 'wickedness'. Their properties include societal complexity, difficult to be formulated, causal webs, being a symptom of other problems, and more. [2,3]

**Phenomenology**  
 Phenomenological research focuses on structural elements of lived experience with **foreground-background dynamics** of attention. These dynamics occur as researchers or professionals are trained to pay attention to entities relevant to their disciplinary domain ('work-world'). [4,5]

**Systems thinking**  
 Systems thinking attempts to understand how systems work in a **holistic** manner rather than in isolation. Identifying root causes of problems stimulate effective problem-solving of nonlinear and turbulent systems. [6]

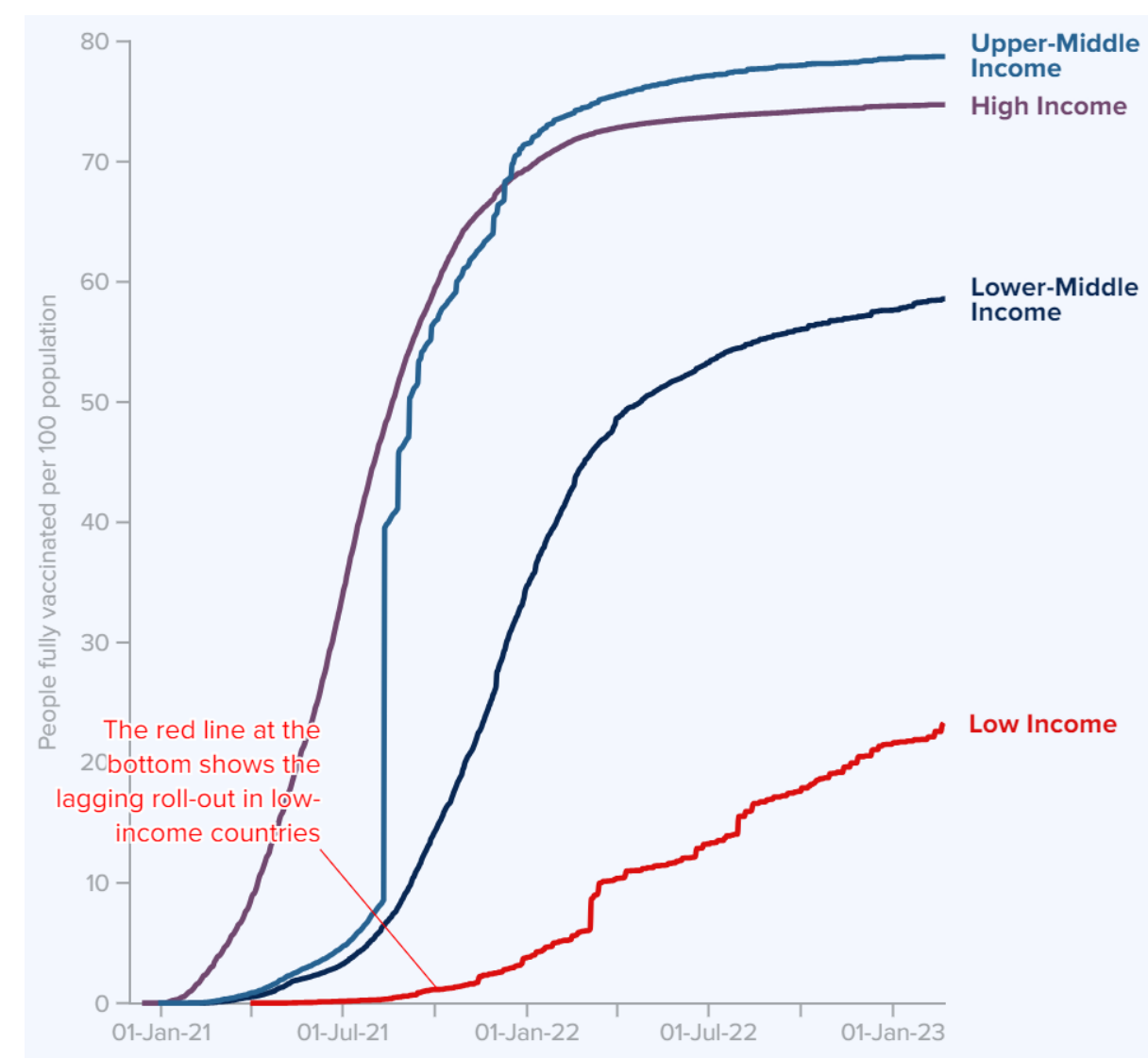


Figure 1: the percentage of people fully vaccinated against COVID-19 over time per income group [1]

### Motivation

Amidst a crisis, focusing attention might be seen necessary, though exacerbating existing silos.

Complexity of wicked problems necessitates **innovative approaches** that move beyond one particular 'work-world' to recognize inherent dynamics of attention that might otherwise go unnoticed.

### Methodology

#### Aim

1. Explore the value of combining **phenomenology** and **systems thinking**
2. Enhance understanding of **wicked problems**, such as vaccine inequity

Facilitate adequate intervention and policy design to better address wicked problems

#### Approach

**DATA**

- Narrative literature analysis
- Expert panel discussion [7]

**APPLICATION**

- Global**: understanding three issues during COVID-19 over time
- Local**: understanding COVID-19 challenges in Tanzania over time

### Results

#### Global (Fig 2)

**Procurement:** limited concerns for well-being of other nations → vaccine nationalism criticism and donations

**Response:** strong focus on non-pharmaceutical measures → less attention to longer term socio-economic costs

**Supply and demand:** foregrounded production capacity → overshadowing capacity issues on the demand side

#### Local

Tanzania's approach to managing COVID-19 has seen several transitions. In 2020, **emphasis shifted away** from non-pharmaceutical measures **towards local remedies** for COVID-like symptoms. Treatment and testing protocols, backgrounded, increasing attention on practices pushed by political and religious leaders [8]. Following a change in presidency in 2021, a shift in focus was realized, with **renewed attention** directed towards comprehensive case reporting and procuring vaccines via COVAX [9].

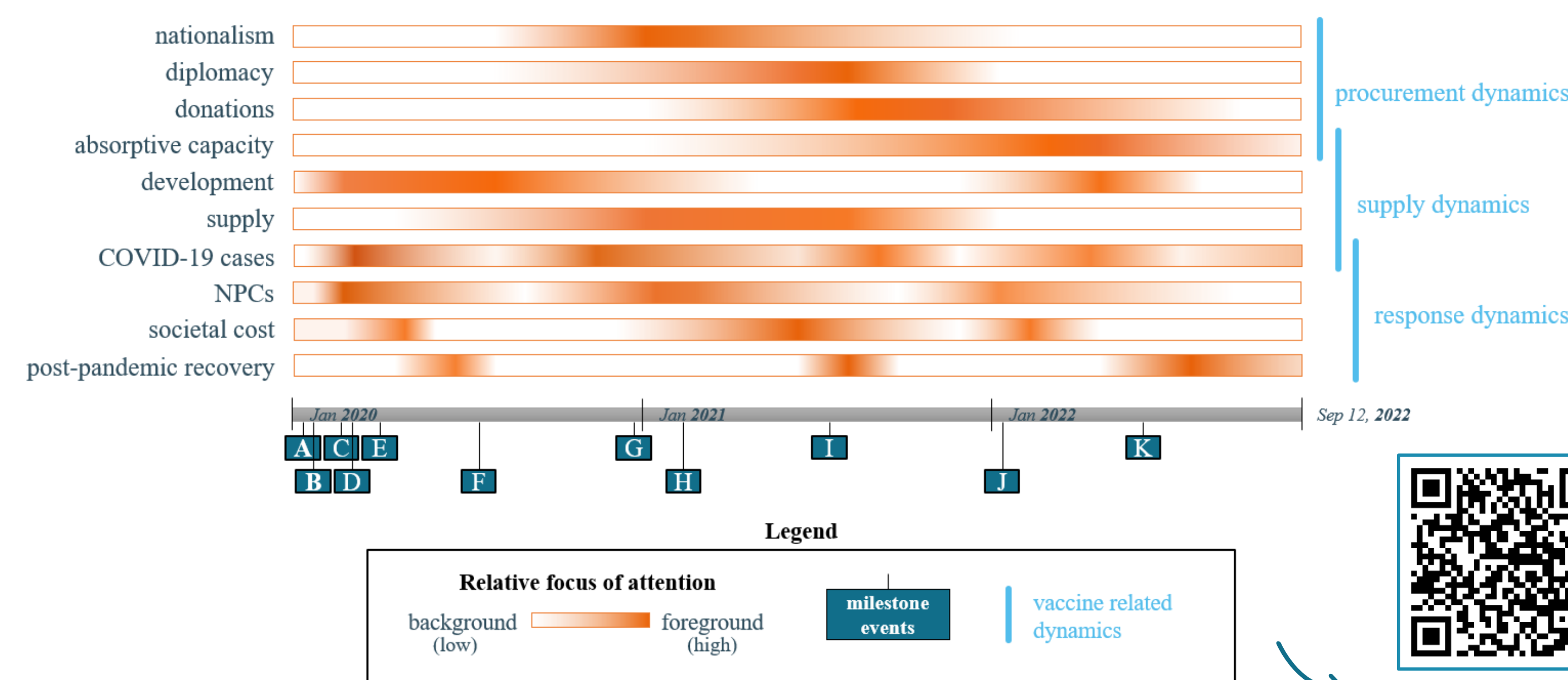


Figure 2: Relative attention on three general dynamics during COVID-19, along with selected milestone events.

### Dynamics

#### Within COVID-19

- **Varying priorities** over time: different 'work-worlds' direct attention to specific issues
- Unintended consequences due to **'backgrounding'**: exacerbated vaccine hesitancy or wastage.
- 'Backgrounding' can enable **'foregrounding'** of problems that were previously overlooked.

#### Beyond COVID-19

- 'Backgrounding' of **other essential (health) system services**: chronic care, routine immunization, sexual and reproductive health, etc. [9].
- Repeated cycles of **"panic and neglect"**: often focus on one crisis at a time
- Move **beyond traditional approaches** e.g., integrate social sciences in preparedness and response efforts

<b>Phenomenology</b>	explicitly focus on <u>dynamics of (inter)subjective experience</u> implicitly concerned with the overarching systems level
<b>Systems thinking</b>	explicitly focus on the overarching <u>systems level</u> implicitly concerned with dynamics of (inter)subjective experience
<b>Integrated approach</b>	stressing the importance of explicitly focusing on <u>both</u> the dynamics of (inter)subjective experience and the overarching systems level

### Take-aways

**Wicked problems** persist and a good understanding of the problem is required to assure adequate interventions and policy design.

Combining phenomenology and system thinking enables deeper understanding of how 'wicked' problems behave.

It's essential to transcend undesirable trade-offs and 'work-worlds' and explore benefits of other methodologies in understanding perspectives and experiences.

**Further research** is required to demonstrate the value and practical aspect of this combination in policy design, for instance, by extending it to other wicked problems.

### Researchers

Charlot Diepvens<sup>1</sup>, Donovan Gutierrez<sup>1</sup>, Tarun Kattumana<sup>1,2</sup>, Laurent Smets<sup>1</sup>, Catherine Decouttere<sup>1</sup>, Julia Jansen<sup>2</sup>, Elisha Osati<sup>3</sup>, Nico Vandaele<sup>1</sup>  
<sup>1</sup>Access-To-Medicines Research Centre, Faculty of Economics & Business, KU Leuven, Leuven, Belgium  
<sup>2</sup>Husserl-Archives, Centre for Phenomenology and Continental Philosophy, KU Leuven, Leuven, Belgium  
<sup>3</sup>Muhimbili National Hospital, Dar es Salaam, Tanzania

Supported by VLIR-UOS and a Pandemic Preparedness Research Chair of Janssen Pharmaceutica



### References

1. UNDP. Global Dashboard for Vaccine Equity. Retrieved March 21, 2023, from Global Dashboard for Vaccine Equity. -UNDP Data Futures Platform
2. Ritzi HWJ, Webber MM. Dilemmas in a general theory of planning. Policy Sci [Internet]. 1973;4(2):155-69. Available from: <https://doi.org/10.1007/BF01405730>
3. Shen AK. Finding a way to address a wicked problem: vaccines, vaccination, and a shared understanding. Hum Vaccin Immunother. 2020 May;16(5):1030-3.
4. Edmund Husserl. Ideas pertaining to a pure phenomenology and to a phenomenological philosophy, First Book: General Introduction to a Pure Phenomenology. Springer Dordrecht; 1983.
5. Edmund Husserl. The Life-World and the World of Science. In: D. Carr (Trans.). In: The Crisis of European Sciences and Transcendental Phenomenology: an Introduction to Phenomenological Philosophy. Northwestern University Press; 1970. p. 379-84.
6. Donella H. Meadows. Thinking in Systems: a Primer. Chelsea green publishing; 2008.
7. A hybrid webinar on 'What's the deal with vaccine equity?' organized by the Access-To-Medicines Research Centre in10. Leuven on March 17, 2022: <https://www.youtube.com/watch?v=BCi6TtObvJM&t=3031s>
8. Houttuin S, Bastmeijer J. Tanzanian doctors sound alarm over hidden coronavirus cases. 2020 May [cited 2022 Sep 27]. Available from: <https://www.thenehumanitarian.org/news/2020/05/14/tanzania-government-hidden-coronavirus-cases>
9. Jerving S. Tanzania finally joins COVAX [Internet]. devex. 2021 [cited 2022 Sep 27]. Available from: <https://www.devex.com/news/tanzania-finally-joins-covax-100172>
10. Ihde D. Experimental Phenomenology. Multistabilities. 2nd ed. State University of New York Press, Albany; 2012.

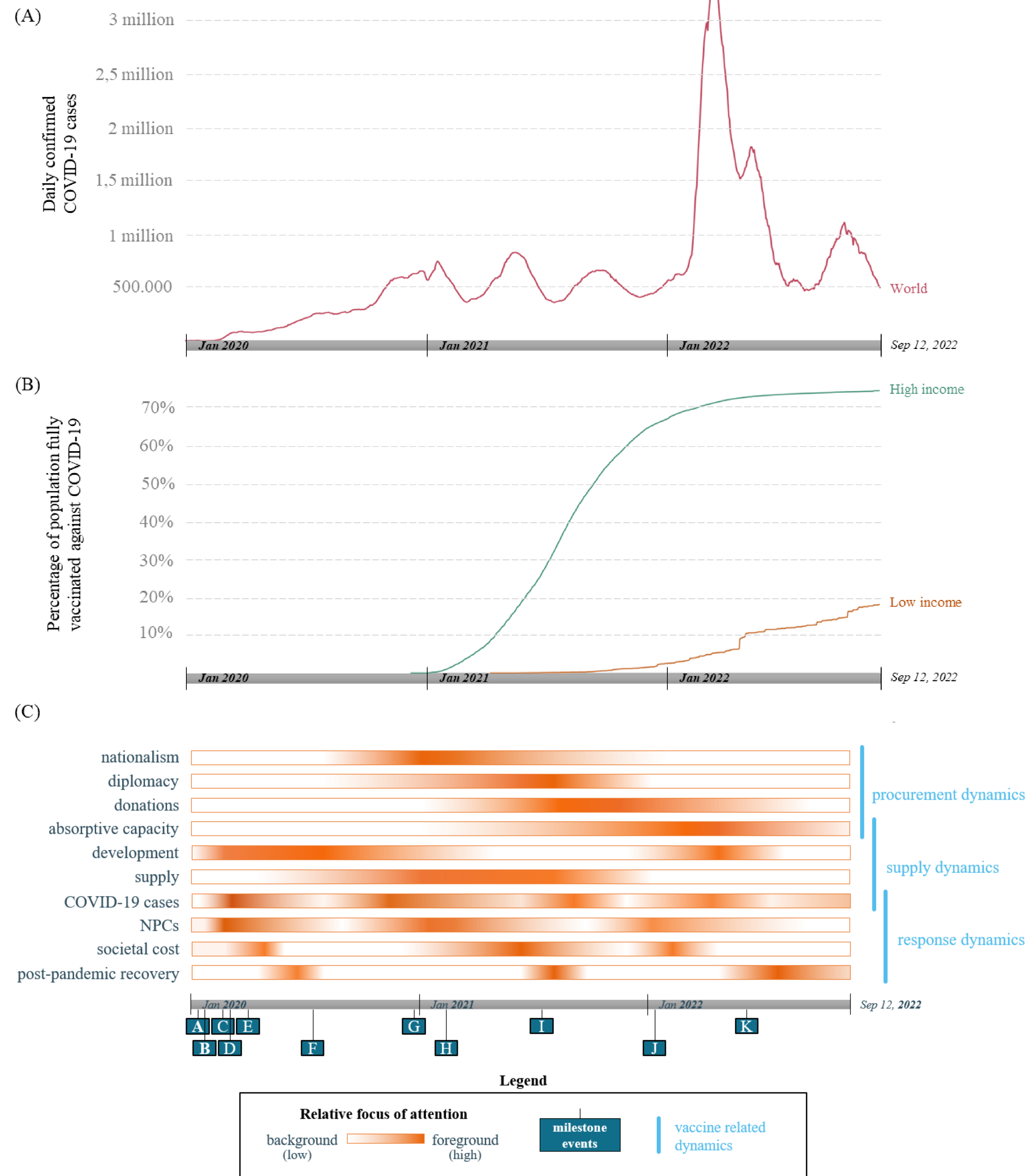
### Contact

catherine.decouttere@kuleuven.be



## Extended Figure 2

Real and perceived dynamics during the COVID-19 pandemic



## Description Figure 2

**(A)** Global daily confirmed COVID-19 cases over time (1).

**(B)** Percentage of the population fully vaccinated against COVID-19 in high-income countries and low-income countries (1). Full vaccination refers to receiving all doses prescribed by the initial vaccination protocol (commonly two doses). Those receiving 1 dose of a 2-dose protocol after having been infected with SARS-CoV-2 are not included to improve comparability across regions.

**(C)** Relative attention on different vaccine related issues evolving over time during the COVID-19 pandemic, along with selected milestone events depicted as letters on the timeline. This is done by approximating the foreground and background dynamics between the selected topics from a global perspective. These topics are bundled into three sets of issues: competitive dynamics of procurement; vaccine supply and demand dynamics; NPCs and response dynamics. Milestone events:

- A: January 30th 2020, the World Health Organization (WHO) declares the first outbreak of nCov-2019 as a 'public health emergency of international concern' (PHEIC) (a)
- B: February 7th 2020, the European Centre for Disease Prevention and Control publishes report on PPE needs in healthcare settings (b)
- C: March 11th 2020, Director General of the WHO declares COVID-19 a global pandemic (c)
- D: March 2020, science communication campaigns in European Union (EU) member states on social distancing, proper use of mouth masks and disinfection of hands (d)
- E: April 14th 2020, European Commission (EC) puts forward an European roadmap towards lifting COVID-19 containment measures of the first wave;
- F: July-August 2020, high-income countries start rushing the pre-order of vaccines, thereby exceeding the per capita need, e.g. the UK government pre-ordered 5 doses per capita (e)
- G: December 2020, EC and U.S. Food & Drug Administration grant conditional market authorization for the first COVID-19 vaccine: Comirnaty (BioNTech and Pfizer) (f,g)
- H: February 24th 2021, first shipment of vaccines from the COVAX Facility to Ghana (h)
- I: August 23rd 2021, the U.S. FDA grants full approval of the first COVID-19 vaccine: Comirnaty (i)
- J: January 2022, COVAX vaccine supply outstrips demand for the first time (j,k)
- K: August 31st 2022, U.S. FDA authorizes bivalent COVID-19 vaccines against the Omicron variant (l)

References  
Figure 2

a: World Health Organization. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV) [Internet]. 2020 [cited 2022 Sep 30]. Available from: [https://www.who.int/news/item/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-\(2019-ncov\)](https://www.who.int/news/item/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov))

b: European Centre for Disease Prevention and Control. Personal protective equipment (PPE) needs in healthcare settings for the care of patients with suspected or confirmed 2019-nCoV [Internet]. Stockholm; 2020 [cited 2022 Sep 30]. Available from: <https://www.ecdc.europa.eu/en/publications-data/personal-science%20communication%20campaigns%20in%20EU%20member%20states%20on%20social%20distancing,%20proper%20use%20of%20mouth%20mask%20and%20disinfection%20of%20handsprotective-equipment-ppe-needs-healthcare-settings-care-patients>

c: Sohrabi C, Alsafi Z, O'Neill N, Khan M, Kerwan A, Al-Jabir A, et al. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). International Journal of Surgery [Internet]. 2020;76:71–6. Available from: <https://www.sciencedirect.com/science/article/pii/S1743919120301977>

d: European Centre for Disease Prevention and Control. Timeline of ECDC's response to COVID-19 [Internet]. 2021 [cited 2022 Sep 30]. Available from: <https://www.ecdc.europa.eu/en/covid-19/timeline-ecdc-response>

e: Callaway E. The unequal scramble for coronavirus vaccines — by the numbers. 2020 Aug [cited 2022 Sep 27]; Available from: <https://www.nature.com/articles/d41586-020-02450-x>

f: U.S. Food and Drug Administration. FDA Takes Key Action in Fight Against COVID-19 By Issuing Emergency Use Authorization for First COVID-19 Vaccine [Internet]. 2020 [cited 2022 Sep 30]. Available from: <https://www.fda.gov/news-events/press-announcements/fda-takes-key-action-fight-against-covid-19-issuing-emergency-use-authorization-first-covid-19>

g: European Centre for Disease Prevention and Control. First COVID-19 vaccine authorised for use in the European Union [Internet]. 2020 [cited 2022 Sep 30]. Available from: <https://www.ecdc.europa.eu/en/news-events/first-covid-19-vaccine-authorised-use-european-union>

h: World Health Organization. COVID-19 vaccine doses shipped by the COVAX Facility head to Ghana, marking beginning of global rollout [Internet]. 2021 [cited 2022 Sep 30]. Available from: <https://www.who.int/news/item/24-02-2021-covid-19-vaccine-doses-shipped-by-the-covax-facility-head-to-ghana-marking-beginning-of-global-rollout>

i: U.S. Food and Drug Administration. FDA Approves First COVID-19 Vaccine [Internet]. 2021 [cited 2022 Sep 30]. Available from: <https://www.fda.gov/news-events/press-announcements/fda-approves-first-covid-19-vaccine>

J:Guarascio F, Rigby J. COVID vaccine supply for global programme outstrips demand for first time. 2022 Feb [cited 2022 Sep 27]; Available from: <https://www.reuters.com/business/healthcare-pharmaceuticals/covax-vaccine-supply-outstrips-demand-first-time-2022-02-23/>

K:EURACTIV. COVAX vaccine supply outstrips demand for the first time [Internet]. 2022 [cited 2022 Sep 27]. Available from: <https://www.euractiv.com/section/coronavirus/news/covax-vaccine-supply-outstrips-demand-for-the-first-time/>

L:Callaway E. The unequal scramble for coronavirus vaccines — by the numbers. 2020 Aug [cited 2022 Sep 27]; Available from: <https://www.nature.com/articles/d41586-020-02450-x>