



São Paulo School of  
Advanced Science on  
Epidemic Preparedness

**School of Public Health, Universidade de São Paulo**  
**July 10-22, 2023**

# Challenges in Developing Indicators to Measure Public Policies

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Wednesday, July 12th 2023

# Outline

1. Context
2. Why we should measure policy intent?
3. How can we increase reliability and validity of indicators that capture policy intent?
4. Why we should measure policy implementation?
5. How can we increase reliability and validity of policy implementation?
6. Back to the Future: Pandemic Preparedness Indicators
7. Summary and concluding remarks



Oxford Supertracker  
The Global Directory for COVID Policy Trackers and Surveys

[Home](#) [Policy Trackers](#) [Surveys](#) [Blog](#) [Contribute](#) [About](#)

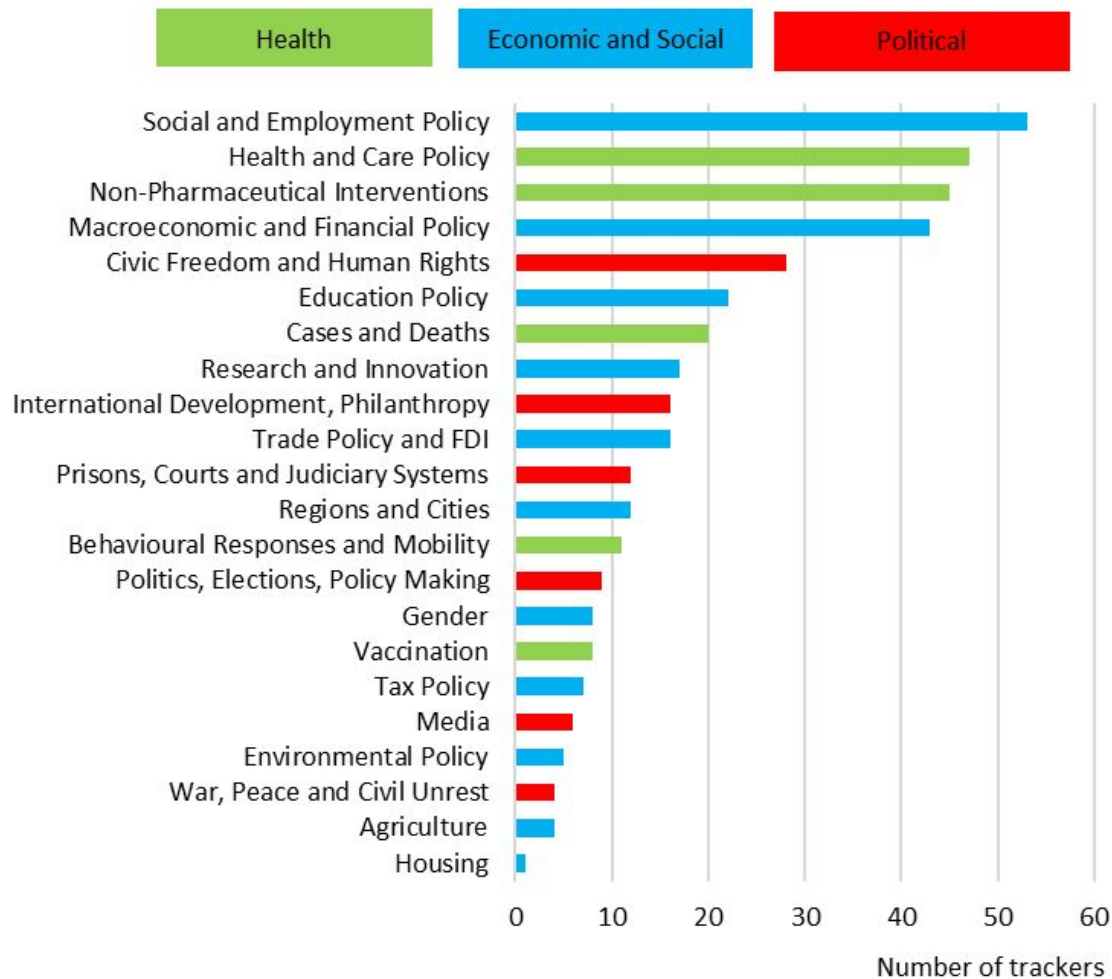
# Policy Trackers

If you maintain or know of an additional dataset, please [submit a new source](#). We will promptly review it in line with our [criteria for inclusion](#).

Results:232/232

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## Policy trackers by area covered



Source: Oxford  
Supertracker, 2021

Table 2: Providers of Policy Trackers (31 August 2020, N=126) by Organizational Type

Providers of policy trackers	N	%
Academics/institutes	42	33.3%
International organizations	33	26.2%
- UN..., ILO	18	14.3%
- OECD (12), EU (5)	17	13.5%
NGOs	21	16.7%
Thinktanks	12	9.5%
Companies (internet, etc.)	13	10.3%
Public agencies (US, CAN)	3	2.4%
<b>All policy trackers</b>	<b>126</b>	<b>100.0%</b>
<i>In addition: directory of surveys (7 September 2020)</i>	44	

Source: Oxford  
Supertracker, 2020



BOLETIM 44 20 de janeiro de 2023

## A Importância de Detectar e Tratar a COVID longa no Brasil. Uma Análise sobre Sintomas dos Indivíduos Acometidos e do Acesso ao Diagnóstico e ao Tratamento.

SAIBA MAIS

### Artigos VER MAIS

**VACCINE** 23 de maio de 2023  
por Antonio Fernando Boing, Alexandra Crispim Boing, Lorena Barberia, Marcelo Eduardo Borges, S.V. Subramanian  
**Uncovering inequities in Covid-19 vaccine coverage for adults and elderly in Brazil: A multilevel study of 2021–2022 data**

**IJID REGIONS** 4 de maio de 2023  
por Ana Freitas Ribeiro, Marcia C. Castro, Gabriela

### Vídeos VER MAIS



**VÍDEOS** 25 de janeiro de 2023  
**Mpox multinacional nas Américas:**

### Mídia VER MAIS

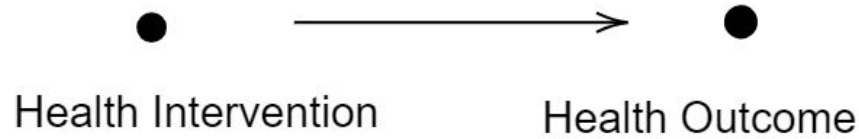


**MÍDIA**  
19 de junho de 2023  
**Desigualdade do país tem impacto forte na**



**JORNAL DA USP**  
17 de junho de 2023  
**Brasil não levou desigualdade social em conta na**

# What we claim to know and study

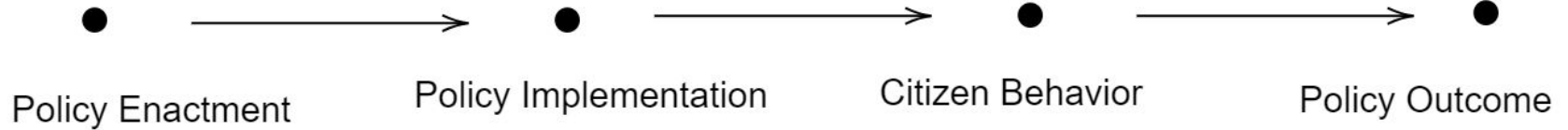




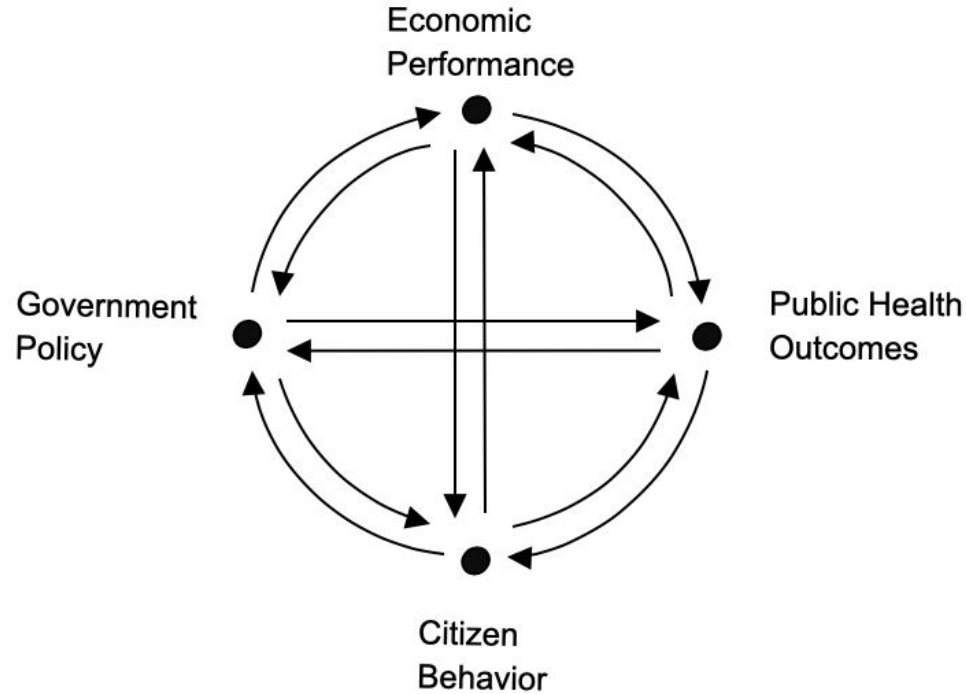
# What we sometimes acknowledge



# What we should be measuring



# What we are trying to study



# What are our goals?

Descriptive Inference

Causal Inference

Impact Policies



# What other factors moderate policy enactment, implementation and outcomes?

State Capacity

Ideology

Rule of Law

Interest Groups

Power Asymmetries



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# How can we effectively measure a given policy?

- Time Period
  - Prior, during and after
- Geographic scope
  - Federal, state, municipal, neighborhood,
- 3 stages
  - Intent? Implementation? Outcome?

# Why should policy intent, implementation and outcomes be measured with robust indicators?

- Benchmarking
- Comparability
- Policy Improvement and Learning
- Evaluation
- Accountability
- Reduce Bias
- Transparency

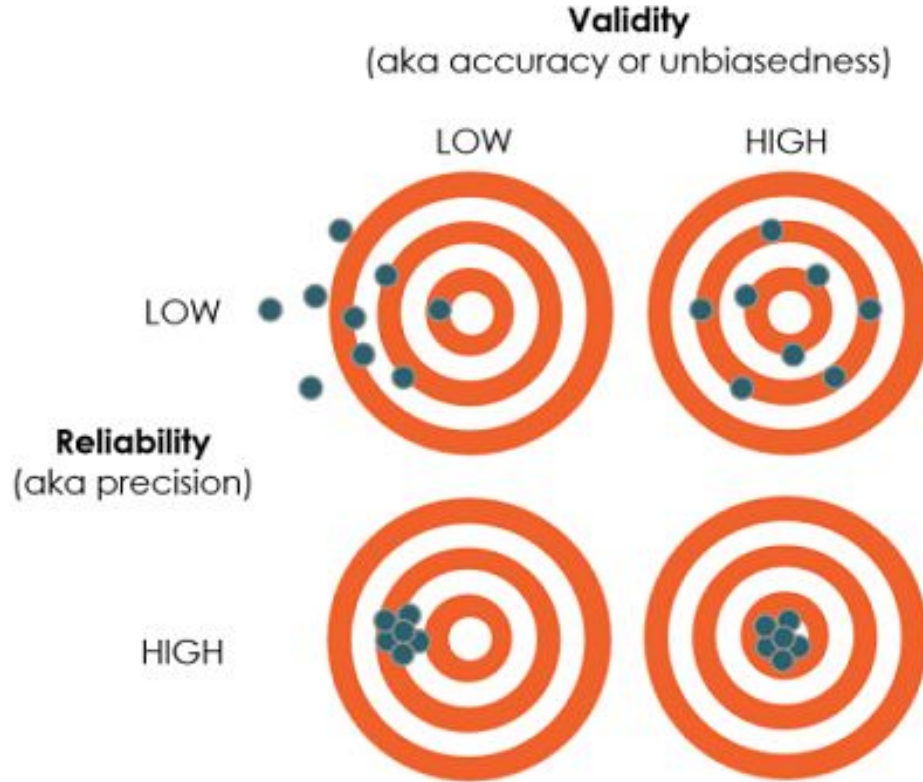
# Who designs enacts policy ?

Quite often, there are several entities that are simultaneously formulating, approving, and implementing policies.

- National government
  - Executive/Legislative/Judiciary
- Different government levels and agencies
  - Central/National, State/Provincial and Local governments
- De facto vs de jure
  - Anvisa and Ministry of Health are both responsible for surveillance.



# Validity and Reliability

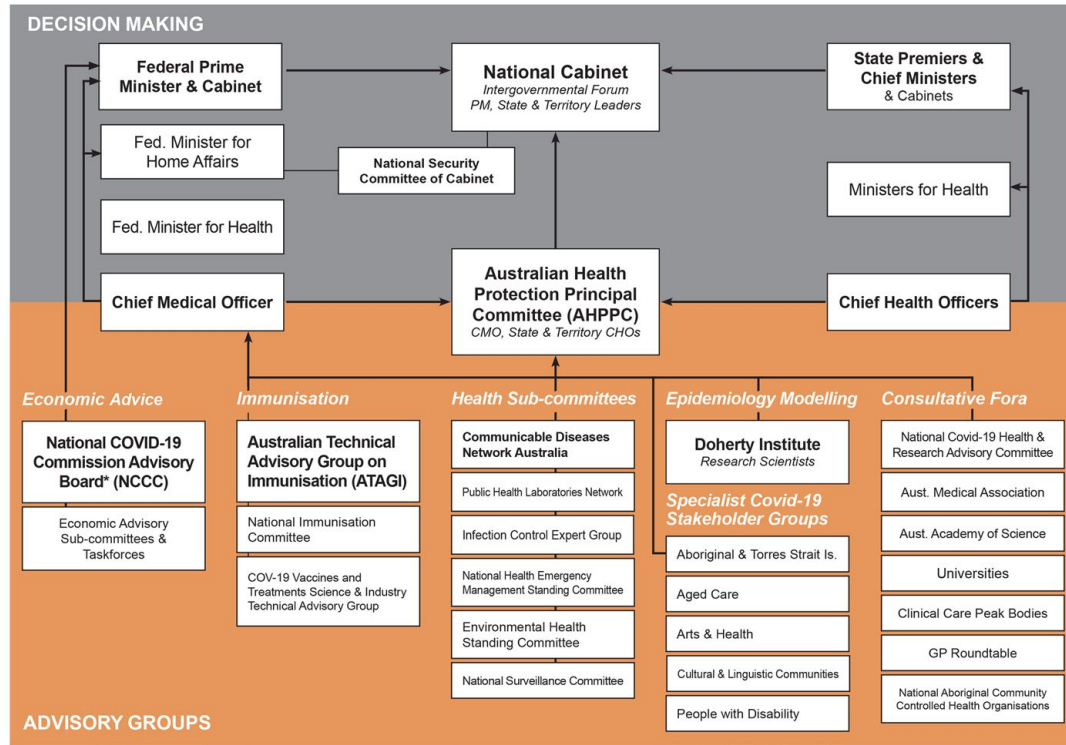


# What type of data should be collected?

There are different types of information that can be used, but there are tradeoffs in terms of their contribution to validity and reliability.

- Government decrees, rulings, bulletins, and other official documents
- Statements and data obtained from governments under freedom of information legislation
- Public speeches, press releases, etc.
- Confidential Interviews
- Surveys of government officials

# What part of government is driving policy ?



**Fig. 2** Australia's expert advisory-decision making bodies relevant for pandemic response during 2020–2021. \*The NCCC was disbanded in May 2021. Orange = advisory groups, grey = decision makers

Source: Easton et al 2021

# What part of government is driving policy ?



Source: Government of Sao Paulo, 2020

# Is policy enactment constant, or changing?

- Often, we assume an intervention is homogenous across time.
- It is costly and difficult to create indicators that capture how policy intent is changing temporally and use them in research designs.

# How can we effectively measure policy with indicators?

- Dichotomous - Two possible outcomes
- Categorical - Distinct categories or levels
- Ordinal - Categories that can be ranked or ordered
- Continuous - A spectrum or a range of values

# Dichotomous Indicators

**Policy Indicator:** Intervention: International Border Closure Enacted

**Coding:** 0 (no), 1(yes)

**Time Dimension:** Days, Weeks, Months, etc.

**Advantages:** Speed of collection

**Disadvantages:** Low level of reliability and validity

# Ordinal Indicator

**Policy Indicator:** International Border Closure Enacted

**Coding:**

0 - no restrictions

1 - screening arrivals

2 - quarantine arrivals from some or all regions

3 - ban arrivals from some regions

4 - ban on all regions or total border closure

**Advantages:**

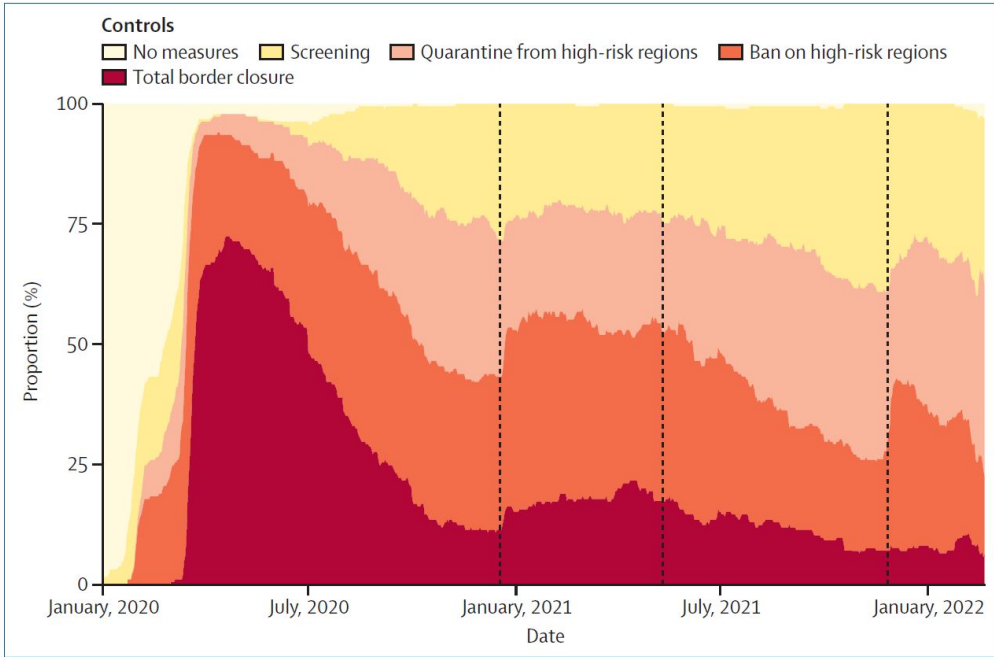
Speed of collection

**Disadvantages:**

Are intervals capturing substantive and homogenous differences?



# Ordinal Indicator



**Figure: Changes in proportion of countries with particular stringency of travel control measures over time**  
Data are from the Oxford COVID-19 Government Response Tracker via Our World In Data.<sup>23</sup> Dashed lines show when alpha, delta, and omicron were declared variants of concern on Dec 18, 2020, May 11, 2021, and Nov 26, 2021, respectively.

# Continuous Indicators

**Policy Indicator:** International Border Closure Enacted

**Coding:** # of countries in which borders are closed

# of countries in which screening of travelers is mandatory

# of travelers entering from each country

**Advantages:** Speed of collection, can be used in more complex statistical analyses and models

**Disadvantages:** Are changes capturing substantive and homogenous differences?

# Continuous Indicators

IJID Regions 7 (2023) 242–251



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Contents lists available at [ScienceDirect](#)

IJID Regions

journal homepage: [www.elsevier.com/locate/ijregi](http://www.elsevier.com/locate/ijregi)



INTERNATIONAL  
SOCIETY  
FOR INFECTIOUS  
DISEASES

## Early response to COVID-19 in Brazil: The impact of a targeted approach to suspected cases and on epidemiological surveillance efforts<sup>☆</sup>



Ana Freitas Ribeiro<sup>a,b</sup>, Marcia C. Castro<sup>c</sup>, Gabriela Lotta<sup>d</sup>, Rebeca de J. Carvalho<sup>e</sup>,  
Marcela Zamudio<sup>f</sup>, Lorena G. Barberia<sup>f,\*</sup>

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<sup>f</sup> Department of Political Science, University of São Paulo, Cidade Universitária, São Paulo – SP, Brazil

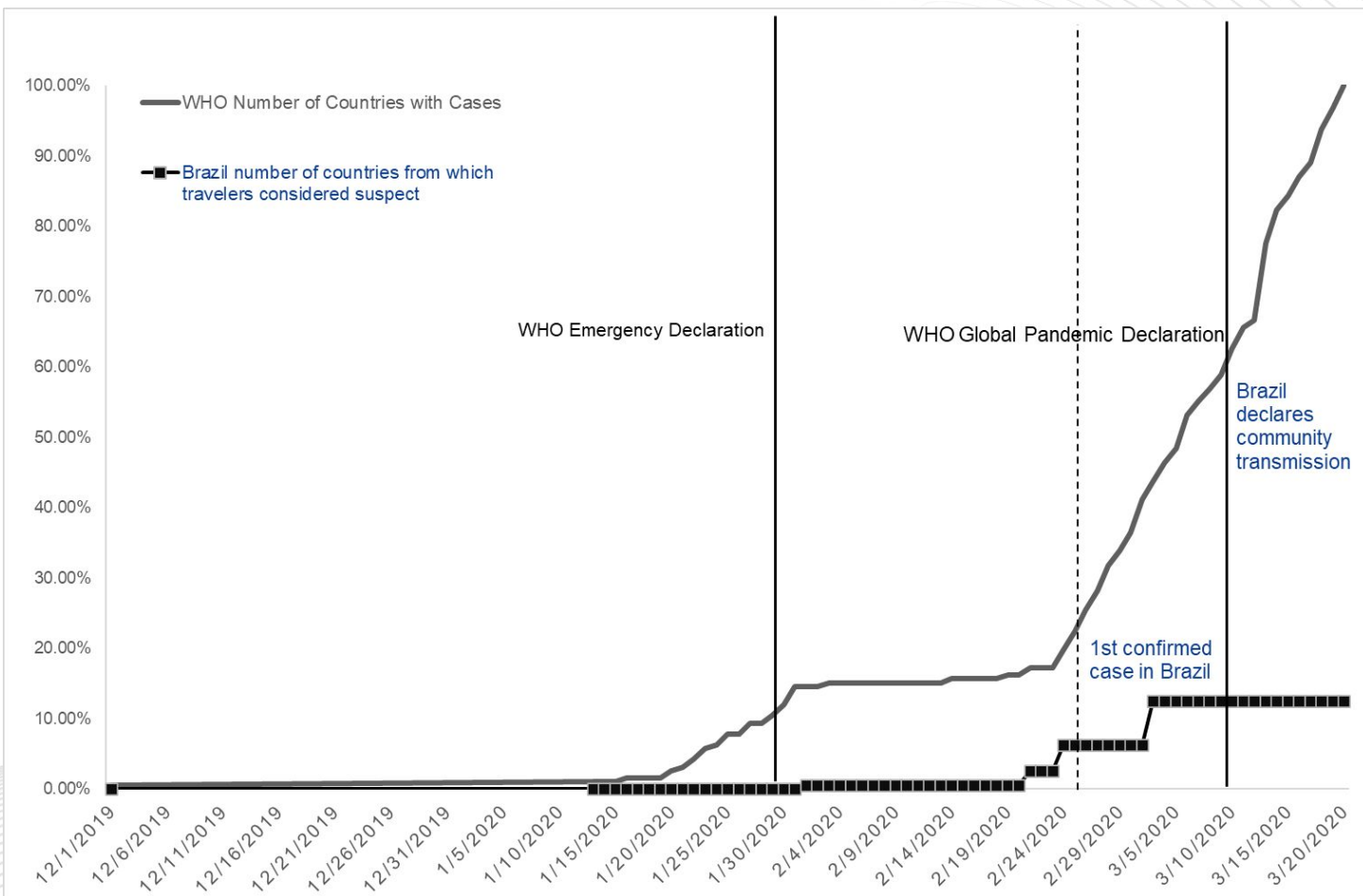
# Policy Intent WHO and MOH/Brazil

**Table 1**

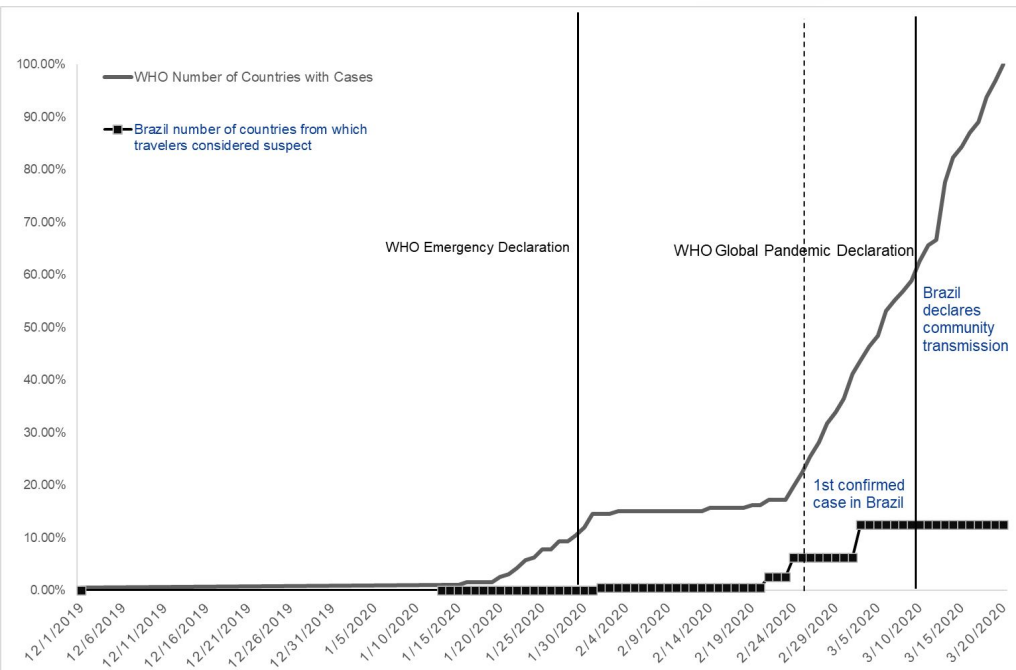
Definitions of a suspected case adopted by the Ministry of Health (Brazil) and the World Health Organization, January 10 to March 20, 2020.

WHO		Ministry of Health, Brazil	
January 10, 2020 <sup>a</sup>	February 27, 2020 <sup>b</sup>	January 22, 2020 <sup>c</sup>	January 28, 2020 <sup>d</sup>
<p><u>Suspected case 1</u> SARI (fever + cough) + hospital admission AND ONE OF FOLLOWING (1) Travel to Wuhan, Hubei Province, China, in the 14 days prior to symptom onset; OR (2) Health care worker working with SARIs; OR (3) Unusual or unexpected clinical course, without regard to the place of residence or history of travel.</p> <p><u>Suspected case 2</u> Acute respiratory illness of any degree of severity who, within 14 days before the onset of illness, had any of the following exposures: (1) Close physical contact with a symptomatic confirmed COVID-19 case; OR (2) A healthcare facility in a country where hospital-associated SARS-CoV-2 infections have been reported; OR (3) Direct contact with animals (if the animal source is identified) in countries where SARS-CoV-2 is circulating in animal populations.</p>	<p><u>Suspected case 1</u> Acute respiratory infection (fever + at least one sign or symptom of respiratory disease) AND no other etiology AND a history of travel to or residence in a country, area, or territory that has reported local transmission of COVID-19 disease during the 14 days prior to symptom onset.</p> <p><u>Suspected case 2</u> Acute respiratory illness AND contact with a confirmed or probable case of COVID-19 disease 14 days prior to the onset of symptoms.</p> <p><u>Suspected case 3</u> SARI (fever + at least one sign or symptom of respiratory disease) AND hospitalization AND no other etiology that fully explains the clinical presentation.</p>	<p><u>Suspected case 1</u> Fever AND/OR respiratory symptoms (e.g., cough or difficulty breathing) AND History of international travel to Wuhan 14 days before the onset of symptoms</p> <p><u>Suspected case 2</u> Fever AND/OR respiratory symptoms (e.g., cough or difficulty breathing) AND Close contact with SARS-CoV-2 suspect case 14 days before the onset of symptoms.</p> <p><u>Suspected case 3</u> Fever OR respiratory symptoms (e.g., cough or difficulty breathing) AND Close contact with a SARS-CoV-2 confirmed case 14 days before the onset of symptoms.</p>	<p><u>Suspected case 1</u> Fever AND at least one respiratory symptom (e.g., cough or difficulty breathing) AND History of international travel to country* with community spread 14 days before the onset of symptoms</p> <p><u>Suspected case 2</u> Fever OR respiratory symptoms (e.g., cough or difficulty breathing) AND Close contact with SARS-CoV-2 suspect case 14 days before the onset of symptoms.</p> <p><u>Suspected case 3</u> Fever OR respiratory symptoms (e.g., cough, or difficulty breathing) AND Close contact with a SARS-CoV-2 laboratory-confirmed case 14 days before the onset of symptoms.</p>

# % Countries WHO and MOH/Brazil



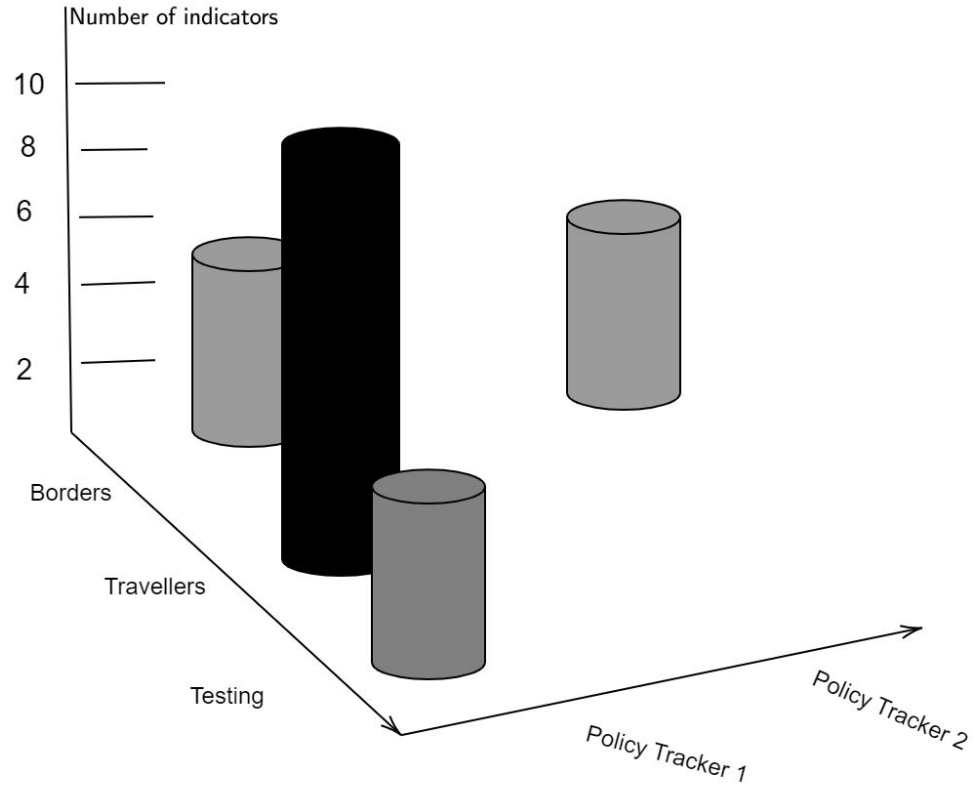
# Reliability and Validity



# Assessing COVID-19 Border/Travel Policy Intent



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Policies

# MOH/Brazil Policy Implementation

Period	Travler Type	Total Samples Collected	Total Positive Tests	Total Hospitalized	Total Travelers	% of Tests Collected	% of Positive Tests	% Hospitalized
Period 0 2020/01/01 to 2020/01/21	Non-designated countries	25	19	11	27	92.59%	70.37%	40.74%
Period 1 2020/01/22 to 2020/01/27	Designated countries	2	1	2	2	100.00%	50.00%	100.00%
Period 1 2020/01/22 to 2020/01/27	Non-designated countries	25	13	7	27	92.59%	48.15%	25.93%
Period 2 2020/01/28 to 2020/02/20	Designated countries	31	24	7	33	93.94%	72.73%	21.21%
Period 2 2020/01/28 to 2020/02/20	Non-designated countries	498	364	77	588	84.69%	61.90%	13.10%
Period 3 2020/02/21 to 2020/02/23	Designated countries	12	9	2	15	80.00%	60.00%	13.33%
Period 3 2020/02/21 to 2020/02/23	Non-designated countries	265	200	28	297	89.23%	67.34%	9.43%
Period 4 2020/02/24 to 2020/03/02	Designated countries	889	607	72	1,013	87.76%	59.92%	7.11%
Period 4 2020/02/24 to 2020/03/02	Non-designated countries	797	457	53	942	84.61%	48.51%	5.63%
Period 5 2020/03/03 to 2020/03/20	Designated countries	3,335	1,327	154	4,062	82.10%	32.67%	3.79%
Period 5 2020/03/03 to 2020/03/20	Non-designated countries	1,173	398	98	1,492	78.62%	26.68%	6.57%
-	Contacts	14,405	1,513	984	19,783	72.82%	7.65%	4.97%
-	No country or period information	748	192	72	940	79.57%	20.43%	7.66%



# Back to the Future: Pandemic Preparedness Indicators

The 140 GHS Index questions are organized across six categories:



**PREVENT**

## 1. PREVENTION

Prevention of the emergence or release of pathogens



**DETECT**

## 2. DETECTION AND REPORTING

Early detection and reporting for epidemics of potential international concern



**RESPOND**

## 3. RAPID RESPONSE

Rapid response to and mitigation of the spread of an epidemic



**HEALTH**

## 4. HEALTH SYSTEM

Sufficient and robust health system to treat the sick and protect health workers



**NORMS**

## 5. COMPLIANCE WITH INTERNATIONAL NORMS

Commitments to improving national capacity, financing plans to address gaps, and adhering to global norms



**RISK**

## 6. RISK ENVIRONMENT

Overall risk environment and country vulnerability to biological threats

# Indexes

- Additive Index
- Additive with Weights
- 0-100?
- Deviation from the Mean?

# Back to the Future: Pandemic Preparedness Indicators

## OVERALL FINDING

**National health security is fundamentally weak around the world. No country is fully prepared for epidemics or pandemics, and every country has important gaps to address.**

The GHS Index analysis finds no country is fully prepared for epidemics or pandemics. Collectively, international preparedness is weak. Many countries do not show evidence of the health security capacities and capabilities that are needed to prevent, detect, and respond to significant infectious disease outbreaks.

**The average overall GHS Index score among all 195 countries assessed is 40.2 of a possible score of 100.**

Among the 60 high-income countries, the average GHS Index score is 51.9. In addition, 116 high- and middle-income countries do not score above 50. Overall, the GHS Index finds severe weaknesses in country abilities to prevent, detect, and respond to health emergencies; severe gaps in health systems; vulnerabilities to political, socioeconomic, and environmental risks that can confound outbreak preparedness and response; and a lack of adherence to international norms.

Specific scores for the GHS Index categories are as follows:

**PREVENTION:** Fewer than 7% of countries score in the highest tier<sup>9</sup> for the ability to prevent the emergence or

**DETECTION AND REPORTING:** Only 19% of countries receive top marks for detection and reporting.

**RAPID RESPONSE:** Fewer than 5% of countries scored in the highest tier for their ability to rapidly respond to and mitigate the spread of an epidemic.

**HEALTH SYSTEM:** The average score for health system indicators is 26.4 of 100, making it the lowest-scoring category.

**COMPLIANCE WITH INTERNATIONAL NORMS:** Less than half of countries have submitted Confidence-Building Measures under the Biological Weapons Convention (BWC) in the past three years, an indication of their ability to adhere to important international norms and commitments related to biological threats.

**RISK ENVIRONMENT:** Only 23% of countries score in the top tier for indicators related to their political system and government effectiveness.

# Back to the Future: Pandemic Preparedness Indicators

Preparedness is not clearly defined, the construction of what constitutes “preparedness” is a *political process*.

State Parties Annual Reporting (SPAR) using government-reported data

WHO-administered Joint External Evaluations (JEE)

Global Health Security Index (GHSI) - Economist/John Hopkins/NTI



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# Back to the Future: Pandemic Preparedness Indicators

Preparedness is not clearly defined, the construction of what constitutes “preparedness” is a *political process*.

Incumbent governments should not be defining the “criteria” or “evaluation”

Researchers and society should be driving the discussion.

# Back to the Future: Pandemic Preparedness Indicators

Preparedness is not clearly defined, the construction of what constitutes “preparedness” is a *political process*.

State Parties Annual Reporting (SPAR) using government-reported data

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Global Health Security Index (GHSI) - Economist/John Hopkins/NTI

# Back to the Future: Pandemic Preparedness Indicators

## Public Health Laboratories Surveillance Capabilities

Barberia *et al.*  
*Global Health Research and Policy* (2022) 7:27  
<https://doi.org/10.1186/s41256-022-00260-4>

Global Health  
Research and Policy

RESEARCH

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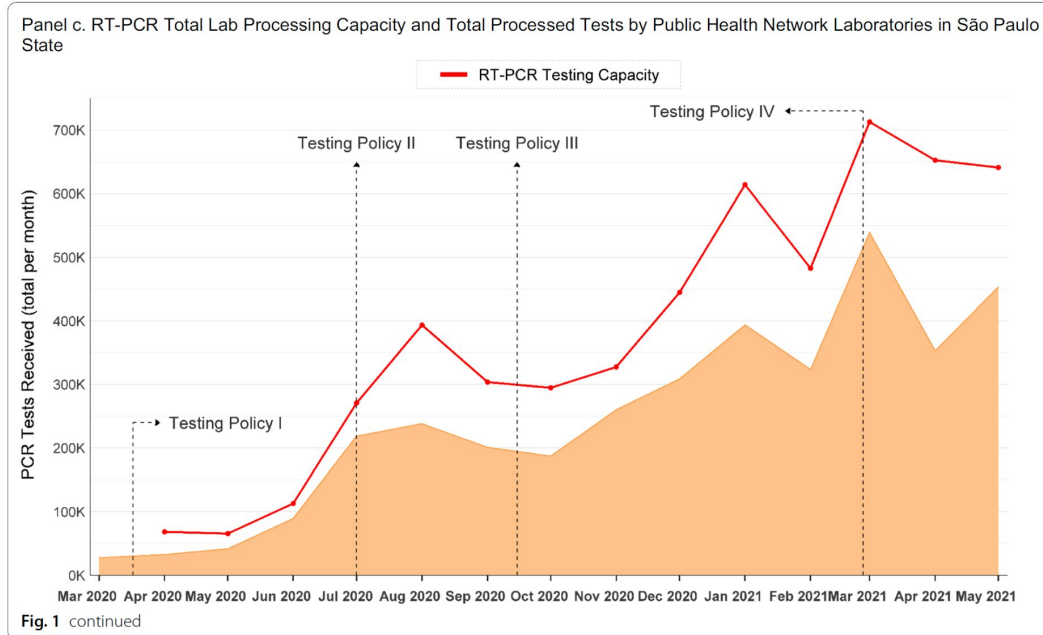
### Evaluation of the effectiveness of surveillance policies to control the COVID-19 pandemic in São Paulo, Brazil



Lorena G. Barberia<sup>1\*</sup> , Natália de P. Moreira<sup>1</sup> , Brigina Kemp<sup>2</sup> , Maria Amelia de Sousa Mascena Veras<sup>3</sup> ,  
Marcela Zamudio<sup>1</sup> , Isabel Seelaender Costa Rosa<sup>1</sup> , Rebeca de J. Carvalho<sup>4</sup>  and Tatiane C. M. Sousa<sup>1,5</sup> 

# Back to the Future: Pandemic Preparedness Indicators

## Public Health Laboratories Surveillance Capabilities





# How to Impact Policy Making?

- Measure what matters, even if it is hard to do (e.g. orphans and lab capacity)
- Timeliness matters, but reliability and validity should be given more attention.
- Complex information needs to be synthesized to influence policy.
- Evidence and data need to be transparent, politicians and governments avoid doing so.
- Be clear on your role and your objectives, recognize ethical conflicts of interest
- Key Stakeholders need to be involved.
- Do not underestimate the politics.

## Concluding Remarks

Most of the indicators we need require a lot of work to measure and there is little political will to generate it.

This does not absolve us as researchers from incorrect inferences.

What we measure is a POLITICAL decision.

What we study is a POLITICAL decision.

If we do not measure, we let others dominate the narrative.

If we do not publish and communicate, we let others dominate the narrative.

# Contributors and Collaborators

LORENA BARBERIA (USP) ISABEL SEELAENDER (USP) MARIA LETÍCIA CLARO DE F. OLIVEIRA (USP) TATIANE C. MORAES SOUSA (FIOCRUZ + USP) GABRIEL ZANLORENSI (USP) REBECA DE JESUS CARVALHO (FGV-CEPESP) FELIPE VILELA (USP) ANDRÉ GARIBE (USP) NATÁLIA DE PAULA MOREIRA (USP) ELLEN FERNANDES (USP) VINICIUS BELLO (USP))	LUIZ GUILHERME ROTH CANTARELLI (USP) PEDRO SCHMALZ (USP, CEPESP/FGV) MARCELA ZAMUDIO (USP, CEPESP/FGV) INGRID CASTRO LOUREIRO SILVA (USP) DARA APARECIDA VILELA PINTO (USP) MAÍRA MEYER (USP) JOÃO GUSMÃO (USP) GUSTAVO FERNANDES DE PAULA (USP) CAROLINA LANGBECK OSSE (USP) RAQUEL REQUENA RACHID (USP)
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For more information:

COVID-19 Government Response Tracker for the Brazilian Federation(CGRT-BRFED)

<https://github.com/cgrtbrfed>

Rede de Pesquisa Solidária em Políticas Públicas e Sociedade

<https://redepesquisasolidaria.org/>

Observatório COVID-19 Br

<https://covid19br.github.io/>

[lorenabarberia@usp.br](mailto:lorenabarberia@usp.br)

Thank you!  
Obrigada!  
Gracias!

The background features a series of thin, light gray wavy lines that create a sense of movement and depth, particularly on the right side of the image.