

# How to distribute scarce health care resources globally? Here's what people say.

Insights on preferences for pandemics and their consistency from representative adult samples in England and Germany



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Vienna, 16 September 2024  
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# Allocation of scarce resources in pandemics

# Scarcity of public goods



Emanuel et al., 2022; Garrett et al., 1993; Jonsen et al., 1998; Kennedy, 2016; Mannelli, 2020; Persad et al., 2009; Rhodes, 2014; Smith & Upshur, 2020; Tong, 2014

<https://pixabay.com/vectors/coronavirus-icon-coronavirus-5107715/>; <https://pixabay.com/vectors/covid-self-test-negative-corona-6155830/>; <https://pixabay.com/vectors/scuba-tank-diving-tank-oxygen-23932/>; <https://pixabay.com/vectors/factory-industry-manufacture-154904/>; <https://pixabay.com/vectors/pallet-transporter-310303/>; <https://pixabay.com/illustrations/vaccine-injection-covid-19-vial-5779405/>; <https://pixabay.com/illustrations/hospital-clipart-bedside-1978209/>



# Ethical distributive justice principles

## **Benefit maximisation** (*Utilitarianism*)

Save as many as possible!



## **Equality**

Lottery!

First come, first served!



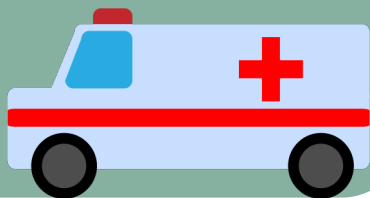
## **Need (Equity)** (*Deontology*)

Prioritise the vulnerable!



## **Social usefulness**

Health care personnel first!



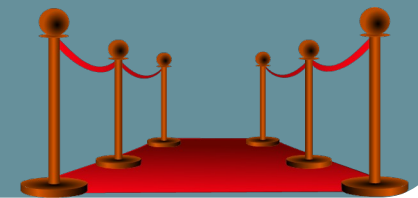
## **Merit**

Adherent individuals first!



## **Entitlement**

Nobelty first!



Boyd, 1997; Boylan, 2014; Campbell et al., 2001; Daniels, 1987; Day et al., 2020; Emanuel et al., 2022; Garrett et al., 1993; Gillon, 1997; Jonsen et al., 1998; Mikula, 1980; Persad et al., 2009; Tong, 2014; Vincent & Creteur, 2020

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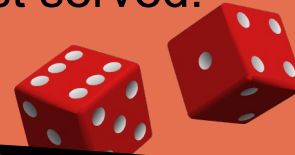


# Ethical distributive justice principles

**Benefit maximisation**  
(*Utilitarianism*)  
Save as many as possible!



**Equality**  
Lottery!  
First come, first served!



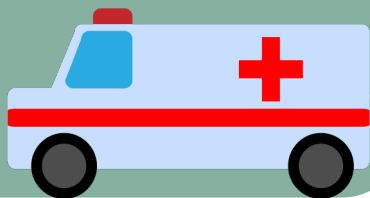
**Not new!**

**Prioritise the vulnerable!**



**Combinations work best.**

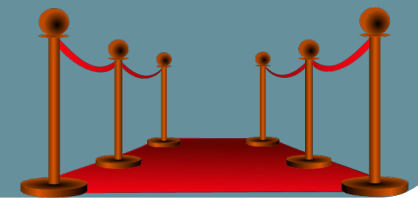
**Social usefulness**  
Health care personnel first!



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**Nobility first!**



Boyd, 1997; Boylan, 2014; Campbell et al., 2001; Daniels, 1987; Day et al., 2020; Emanuel et al., 2022; Garrett et al., 1993; Gillon, 1997; Jonsen et al., 1998; Mikula, 1980; Persad et al., 2009; Tong, 2014; Vincent & Creteur, 2020

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# During pandemics, distributive justice is global.

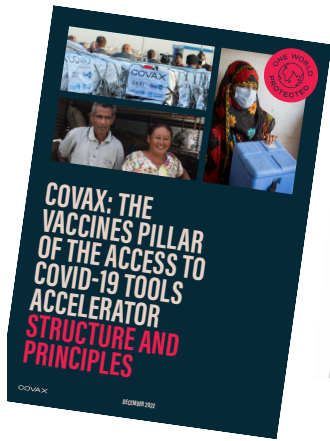


Ali et al., 2024; Bolcato, et al., 2021; Bruce & Tallman, 2021; Chen et al., 2021; Emanuel, Persad, Kern et al., 2020; Emanuel, Persad, Upshur et al., 2020; Evans, 2020; Hempel et al., 2021; Holtzman et al., 2022; Ismail et al., 2021; Jecker et al., 2021; Liu et al., 2020; Luna & Holzer, 2021; Marmot & Allen, 2020; Marmot et al., 2020; McMahon et al., 2020; Moodley et al., 2021; Shadmi et al., 2020; Sirleaf et al., 2021; Wild et al., 2022; WHO, 2020



# Solidarity

(“Vaccine cosmopolitanism”)



The Washington Post  
Democratic Dies in Darkness

## White House launching \$5 billion program to speed coronavirus vaccines

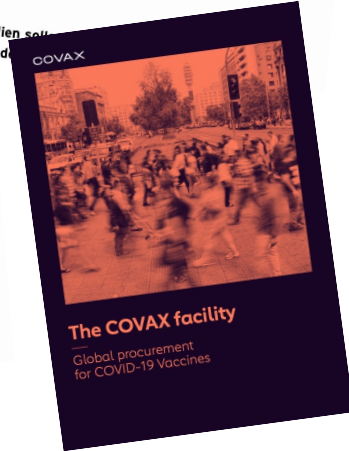
“Project Next Gen” would succeed “Operation Warp Speed” with a mission to develop next-generation vaccines and therapies

Corona-Pandemie

## Berlin nimmt schwer kranke Patienten aus Frankreich auf

Sa 28.03.20 | 16:02 Uhr

Nach ersten Covid-19-Patienten aus Italien soll Frankreich an der Berliner Charité behandelt werden



The New York Times

## Pfizer Will Allow Its Covid Pill to Be Made and Sold Cheaply in Poor Countries

The company announced a deal that could help significantly expand access to the Covid-19 treatment, but the agreement excludes a number of countries hit hard by the pandemic.

# Protectionism

(“Vaccine nationalism”)



Advance Purchase Agreements

SZ Meine SZ | SZ Plus | Ukraine | Israel | Politik | Wirtschaft | Meinung | Panorama  
Corona-Pandemie

## Impf-Patente: Merkel widerspricht Biden

Der US-Präsident vollzieht eine radikale Wende und will Lizenzen für Covid-19-Vakzine freigeben. Berlin und Brüssel setzen dagegen auf Exporte in ärmere Länder.  
Bundeskanzlerin Angela Merkel (CDU) hat skeptisch auf den Vorstoß der USA reagiert, die Patente für Impfstoffe befristet freizugeben, um so deren globale Verteilung zu beschleunigen. “Der Schutz von Innovation und der Quelle von Innovation und



## Coronavirus puts Europe's solidarity to the test

CBC | MENU

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Politics

## Canada has ordered more than 400 million COVID-19 vaccine shots: Here's the progress report

Six months into vaccination campaign, some companies have delivered while others are a work in progress

## The Guardian US secures world stock of key Covid-19 drug remdesivir

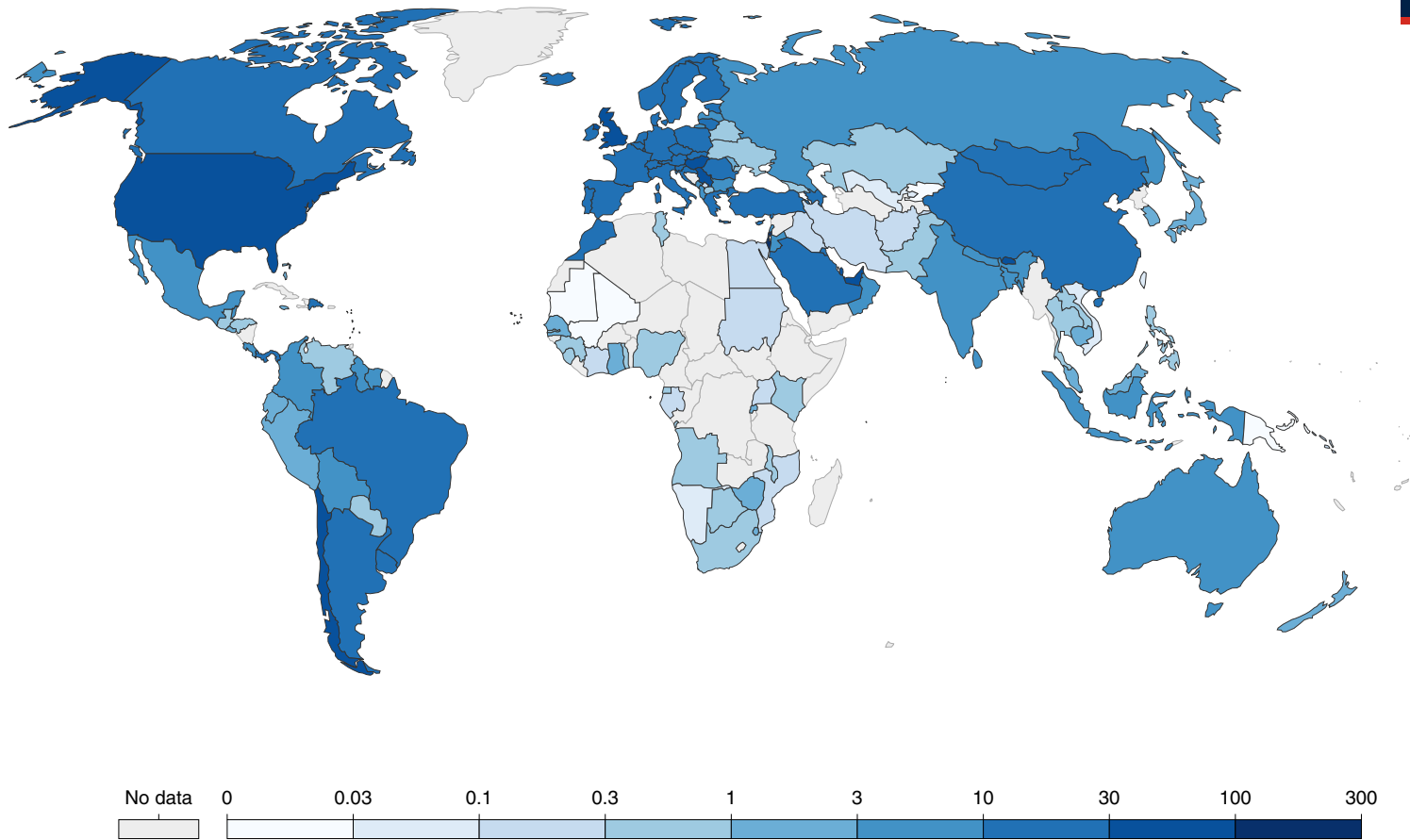
No other country will be able to buy remdesivir, which can help recovery from Covid-19, for next three months at least

The US has bought up virtually all the stocks for the next three months of one of the two drugs proven to work against Covid-19, leaving none for the UK, Europe or most of the rest of the world.

Earlier this week, Germany and the Czech Republic decided to ban exports of medical protection equipment such as masks and gloves. The objective was to make sure that health workers have enough to deal with the coronavirus outbreak.

But this is something that Belgian health minister Maggie de Block criticised today.

Abbas, 2020; Ali et al., 2024; Bollyky & Bown, 2020; COVAX, 2020; Ganderberger et al., 2023; Herlitz et al., 2021; ICODA, 2024; McMahon et al., 2020; Sirleaf et al., 2021; Tandon, 2021; WHO, 2023a, 2023b; Wouters et al., 2021; see Jecker et al., 2023, and Luna & Holzer, 2021, for in-depth analyses



**Fig. 3 | Cumulative vaccine doses administered per 100 people in the total population.** Shown are the global data as of 7 April 2021. Single doses are counted, and may not equal the total number of people vaccinated, depending on the specific dose regime (some people may have received multiple doses).

Abbas, 2020; Ali et al., 2024; Campbell et al., 2001; Garrett et al., 1993; Ismail et al., 2021; Jecker et al., 2021; Jonsen et al., 1998; Katz et al., 2021; Lagman, 2021; Luna & Holzer, 2021; Mandavilli, 2024a; Mathieu et al., 2021; McMahon et al., 2020; Smith & Upshur, 2020; Tandon, 2021; WHO, 2023b, 2024



**Did this align with the will of the people?**


How would “ordinary” citizens have decided?




# What do people think (within-society distribution)?

before COVID-19

**Benefit maximisation**  
(Utilitarianism)  
Save as many as possible!



**Equality**  
Lottery!  
First come, first served!



**Need (Equity)**  
(Deontological)  
Prioritise the vulnerable!



**Social usefulness**  
Health care personnel first!



**Merit**  
Adherent individuals first!



**Entitlement**  
Nobility first!



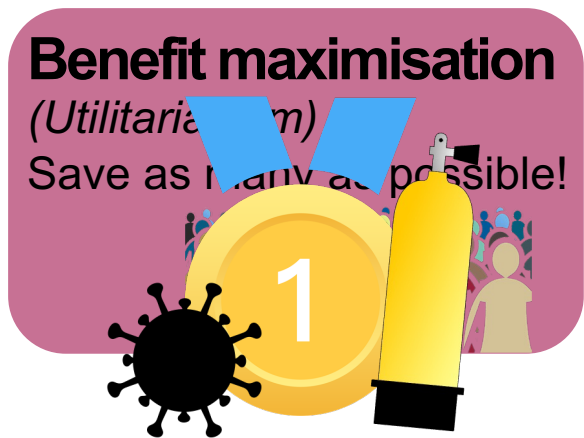
Bailey et al., 2011; Biddle et al., 2020; Ceccato et al., 2023; Cookson & Dolan, 1999; Dowling et al., 2022; Duch et al., 2021; Ganderberger et al., 2023; Grover et al., 2020; Jensen & Petersen, 2017; Kappes et al., 2022; Knotz et al., 2021a, 2021b; Krütli et al., 2016; Oedingen et al., 2019; Persad et al., 2021; Sprengholz et al., 2021; Tong et al., 2010

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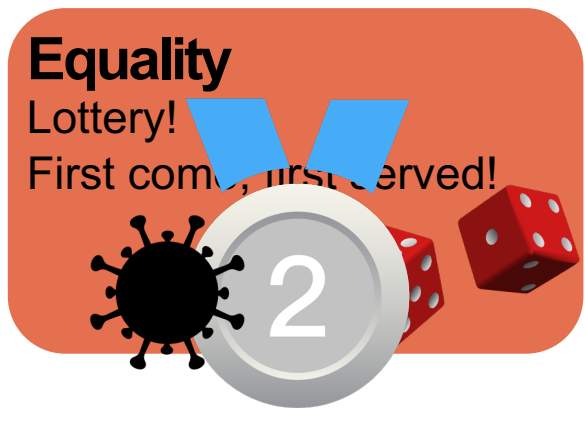
# What do people think (within-society distribution)?

during COVID-19

**Benefit maximisation**  
(Utilitarianism)  
Save as many as possible!

A purple rounded rectangle containing a black virus icon, a gold coin with the number '1', and a yellow oxygen tank. In the background, there are silhouettes of people.

**Equality**  
Lottery!  
First come, first served!

An orange rounded rectangle containing a black virus icon, a silver coin with the number '2', and two red dice.

**Need (Equity)**  
(Deontological)  
Prioritise the vulnerable!

A green rounded rectangle containing a black virus icon, a gold coin with the number '1', and silhouettes of people carrying books on their heads.

**Social usefulness**  
Health care personnel first!

A teal rounded rectangle containing a black virus icon, a gold coin with the number '1', and a white ambulance with a red cross.

**Merit**  
Adherent individuals first!

A teal rounded rectangle containing a gold medal with a laurel wreath and a red ribbon.

**Entitlement**  
Nobility first!

A blue rounded rectangle containing a red carpet with stanchions and a gold coin with the number '1'.

Bailey et al., 2011; Biddle et al., 2020; Ceccato et al., 2023; Cookson & Dolan, 1999; Dowling et al., 2022; Duch et al., 2021; Gandenberger et al., 2023; Grover et al., 2020; Jensen & Petersen, 2017; Kappes et al., 2022; Knotz et al., 2021a, 2021b; Krütli et al., 2016; Oedingen et al., 2019; Persad et al., 2021; Sprengholz et al., 2021; Tong et al., 2010

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# What do people think (**global** distribution)?





A bright yellow L-shaped graphic that frames the central text. It consists of a horizontal bar at the top, a vertical bar on the right side, and a horizontal bar at the bottom. The text 'Our study' is centered within the white space created by these bars.


Our study

# Samples

## Cohort 1

- ✓ Online questionnaire study
- ✓ Summer 2021
- ✓ Recruitment: Respondi (Bilendi)
- ✓  
- ✓ Representative
- ✓ Quality checked
- ✓ **N = 2692**  
( $n_{\text{England}} = 1328$ ,  $n_{\text{Germany}} = 1364$ )

## Cohort 2

- ✓ Online questionnaire study
- ✓ Spring 2024
- ✓ Recruitment: Bilendi (Respondi)
- ✓ 
- ✓ Representative
- ✓ Quality checked
- ✓ **N =  $n_{\text{Germany}} = 1155$**

# Global Resource Distribution Principles Scale (GRDP)

**Until enough COVID-19 vaccine can be produced to supply the entire world, I think it would be just if ...**

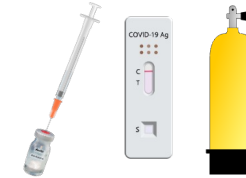
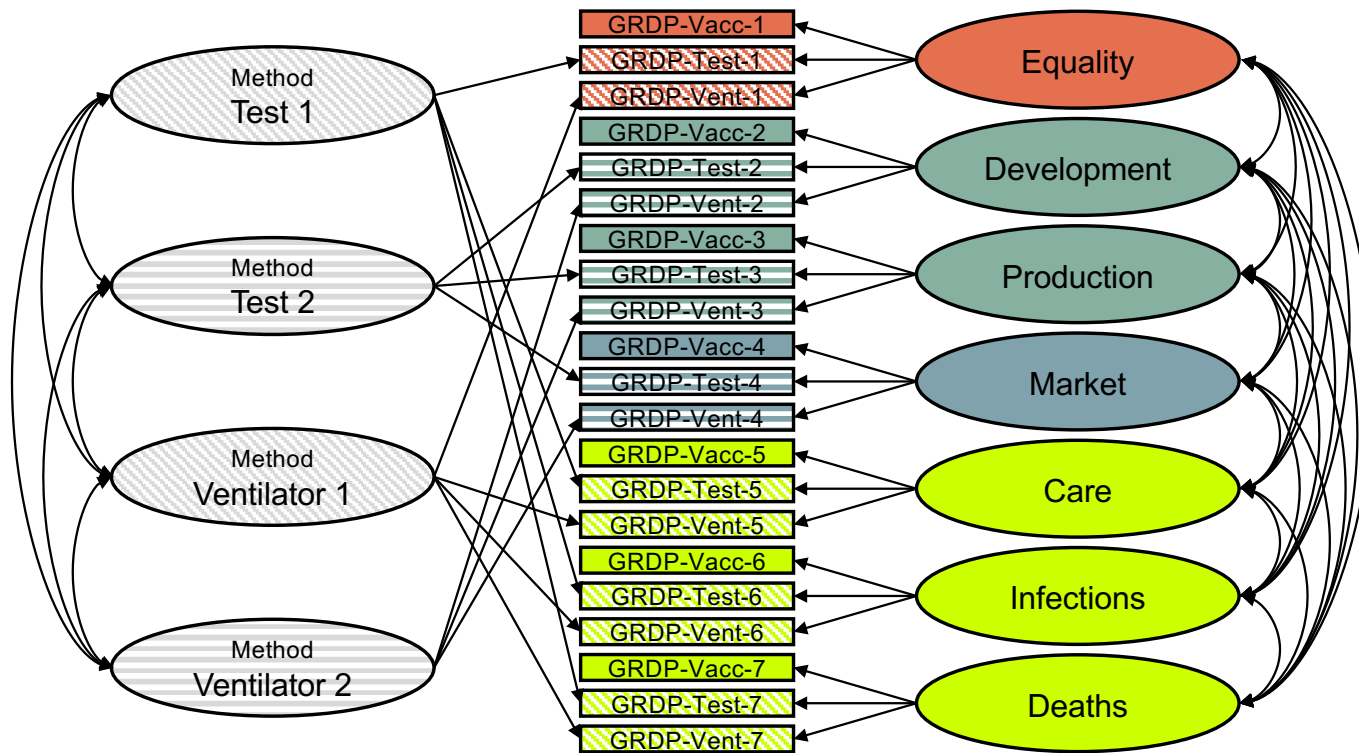
1	Equality	<i>All countries equally (per capita)!</i>
2	Merit: Development	<i>Countries that developed the resource first!</i>
3	Merit: Production	<i>Countries that produced the resource first!</i>
4	Entitlement: Market	<i>Countries that pay more first!</i>
5	Need: Care	<i>Countries with worse treatment possibilities first!</i>
6	Need: Infections	<i>Countries with highest infection rates first!</i>
7	Need: Deaths	<i>Countries with highest death tolls first!</i>



<https://pixabay.com/vectors/scuba-tank-diving-tank-oxygen-23932/>; <https://pixabay.com/vectors/covid-self-test-negative-corona-6155830/>; <https://pixabay.com/illustrations/vaccine-injection-covid-19-1a1a5779405/>

cf. Fischer et al., 2017





**Justice principle**

- Equality
- Merit
- Entitlement
- Need
- Benefit maximisation

cf. Eid et al., 2017

<https://pixabay.com/vectors/scuba-tank-diving-tank-oxygen-23932/>; <https://pixabay.com/vectors/covid-self-test-negative-corona-6135830/>; <https://pixabay.com/illustrations/vaccine-injection-covid-19-vial-5779405/>



# Global Resource Distribution Principles Scale (GRDP)

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7	Need: Deaths	<i>Countries with highest death tolls first!</i>

2021



cf. Fischer et al., 2017

17

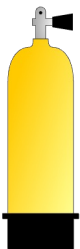


# Global Resource Distribution Principles Scale (GRDP)

**In a fictional future pandemic, until enough vaccine can be produced to supply the entire world, I think it would be just if ...**

1	Equality	<i>All countries equally (per capita)!</i>
2	Merit: Development	<i>Countries that developed the resource first!</i>
3	Merit: Production	<i>Countries that produced the resource first!</i>
4	Entitlement: Market	<i>Countries that pay more first!</i>
5	Need: Care	<i>Countries with worse treatment possibilities first!</i>
6	Need: Infections	<i>Countries with highest infection rates first!</i>
7	Need: Deaths	<i>Countries with highest death tolls first!</i>
8	Benefit maximisation: Efficiency	<i>End the pandemic globally asap!</i>
9	Merit: Adherence	<i>Societies that adhere to containment measures first!</i>
10	Entitlement: "Value"	<i>Countries with more "valuable" citizens first!</i>

2024

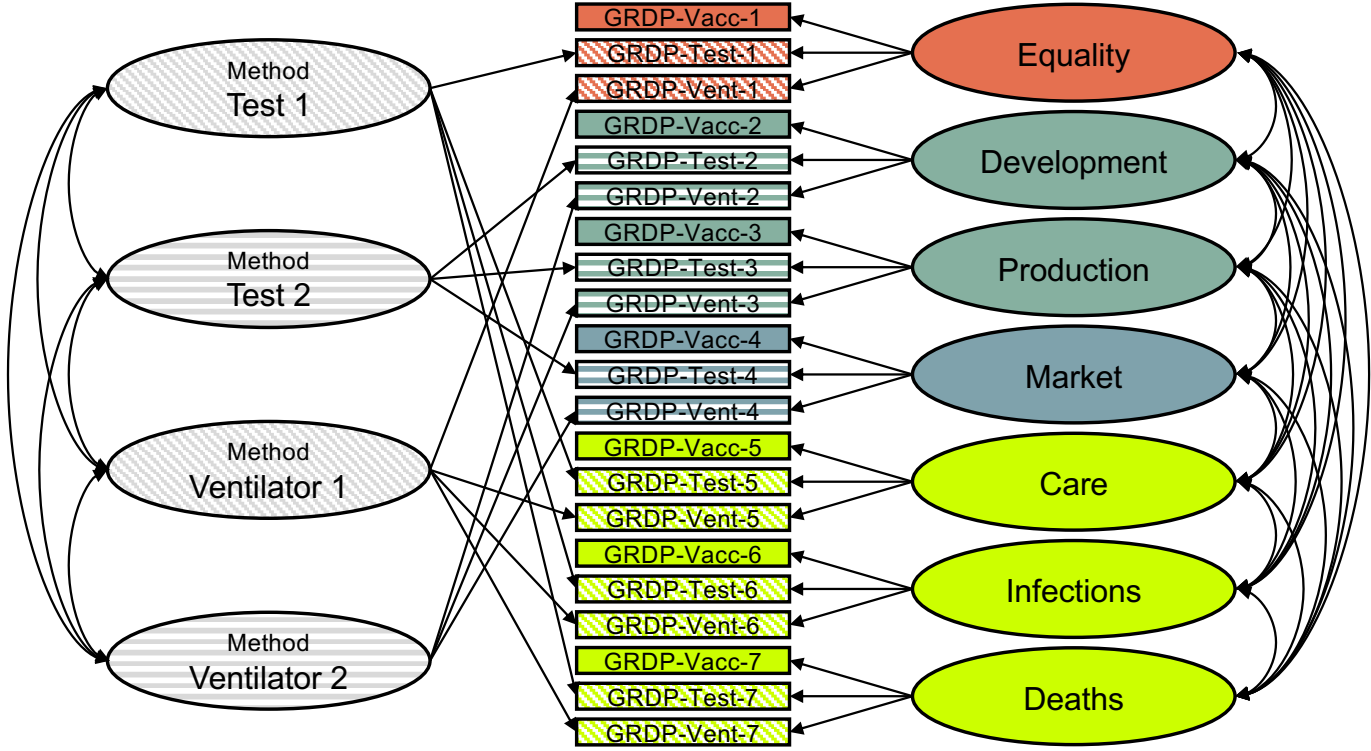


cf. Fischer et al., 2017

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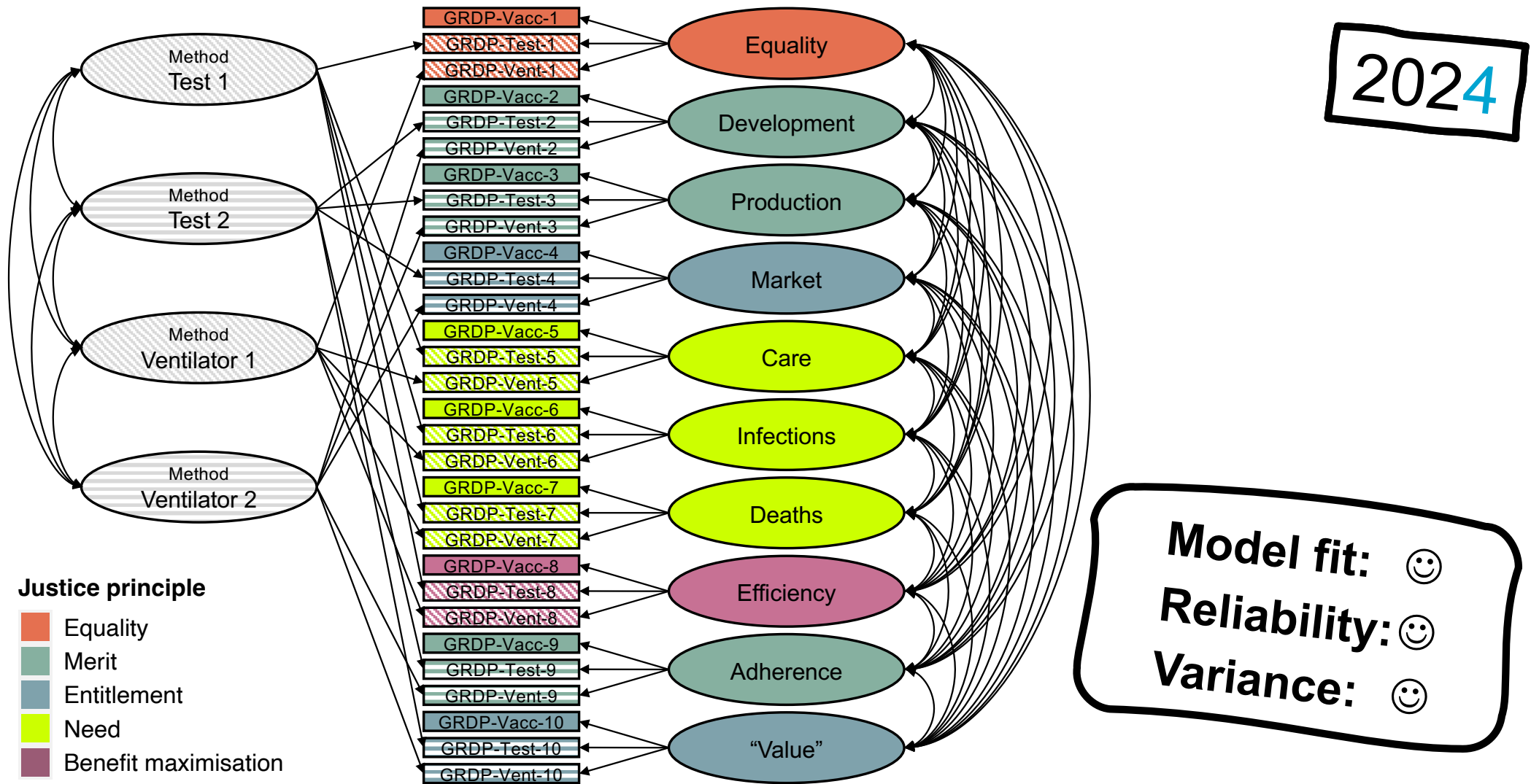


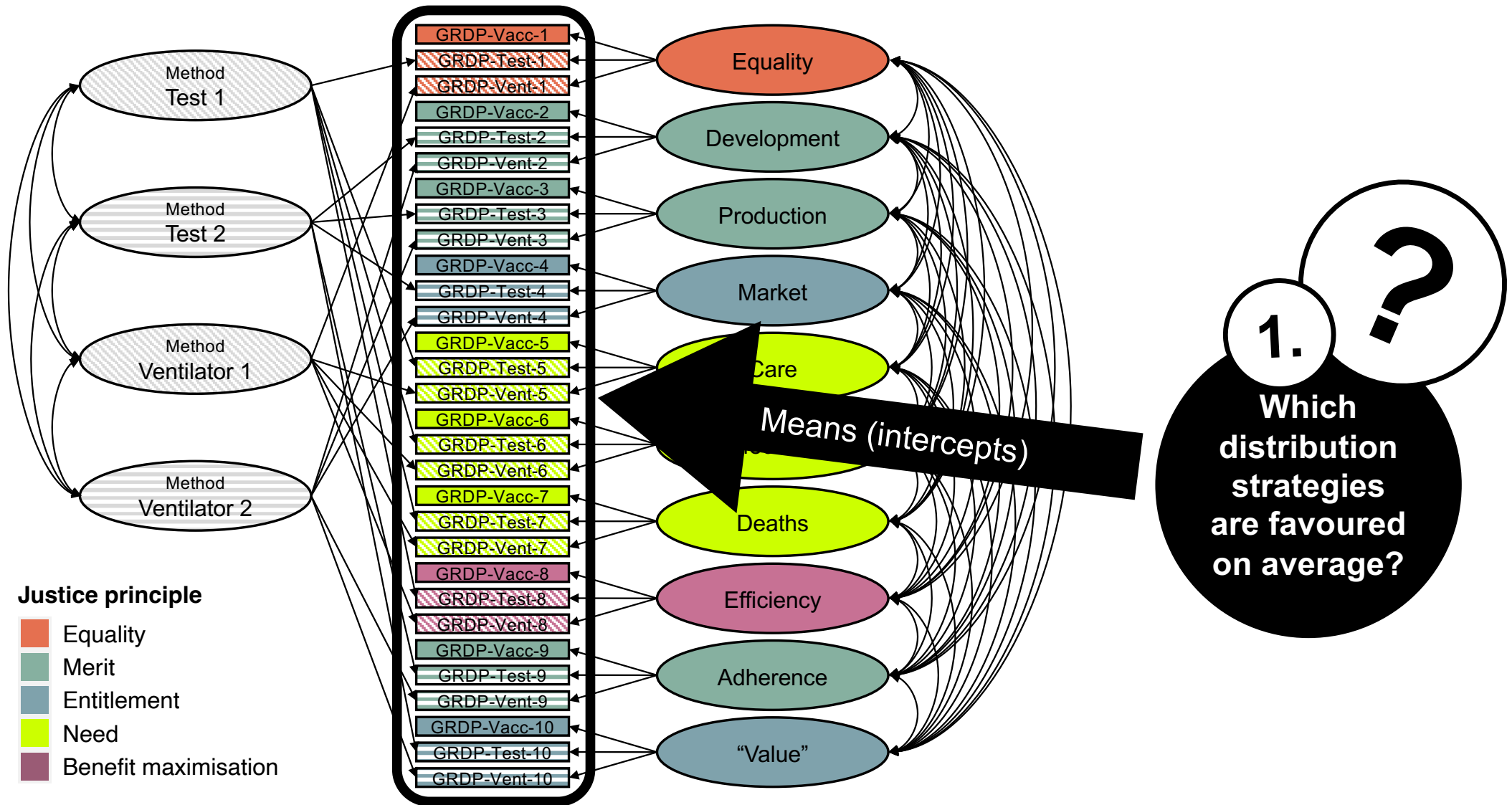
2021



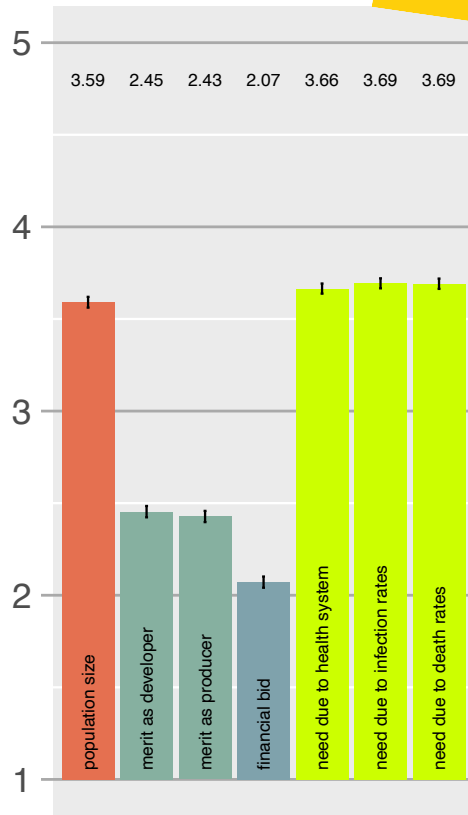
**Justice principle**

- Equality
- Merit
- Entitlement
- Need
- Benefit maximisation

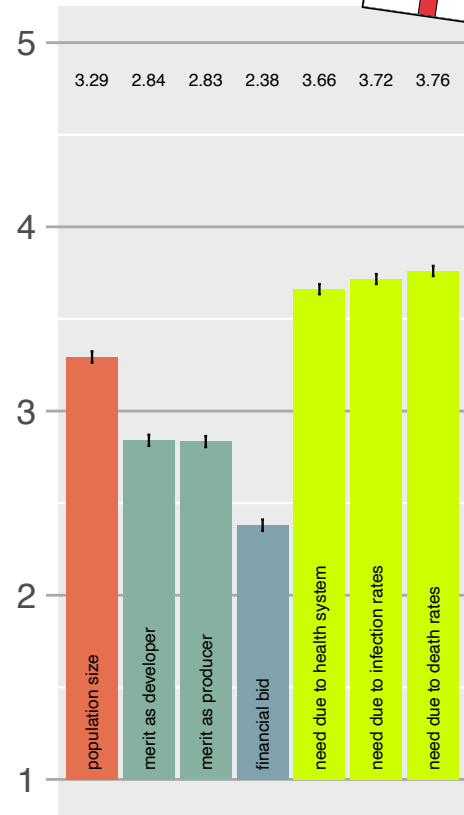




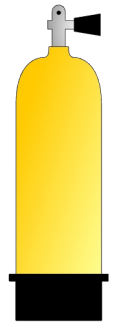
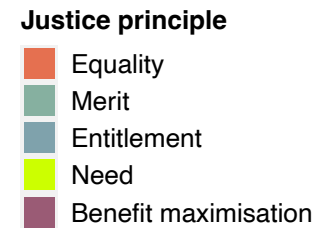
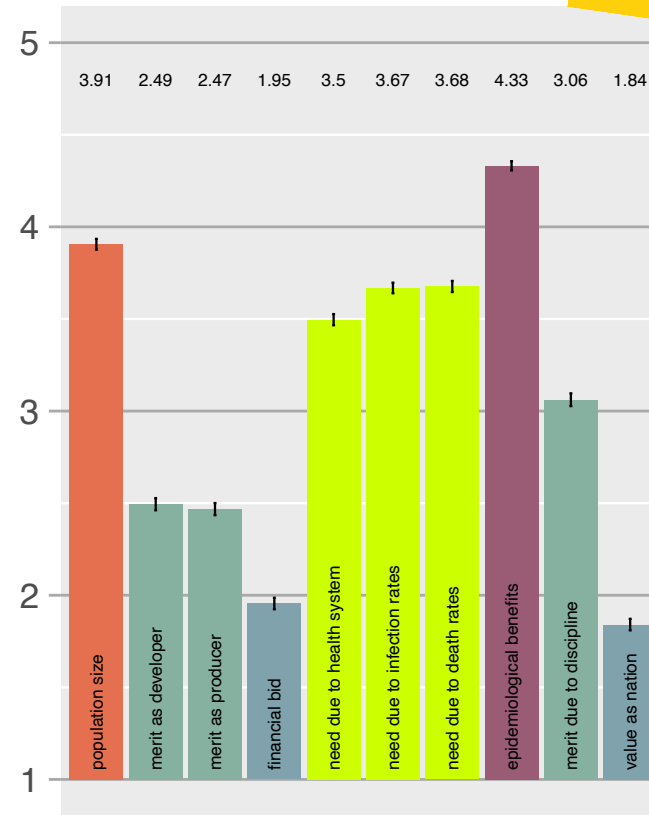
Germany, 2021  
regarding COVID-19



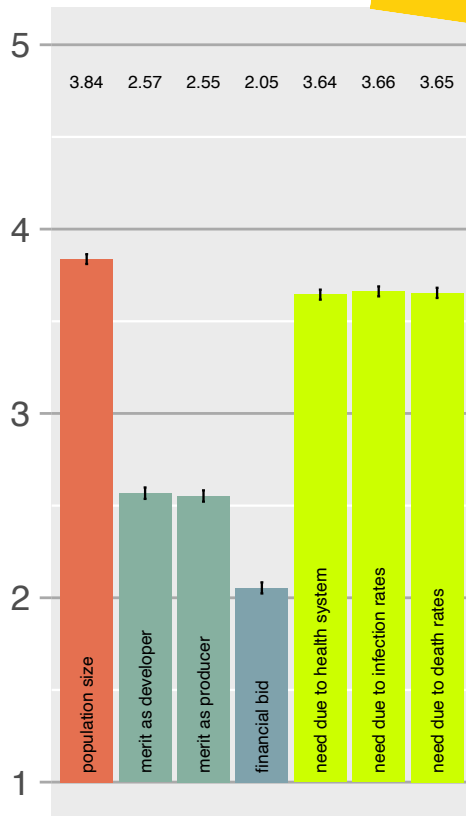
England, 2021  
regarding COVID-19



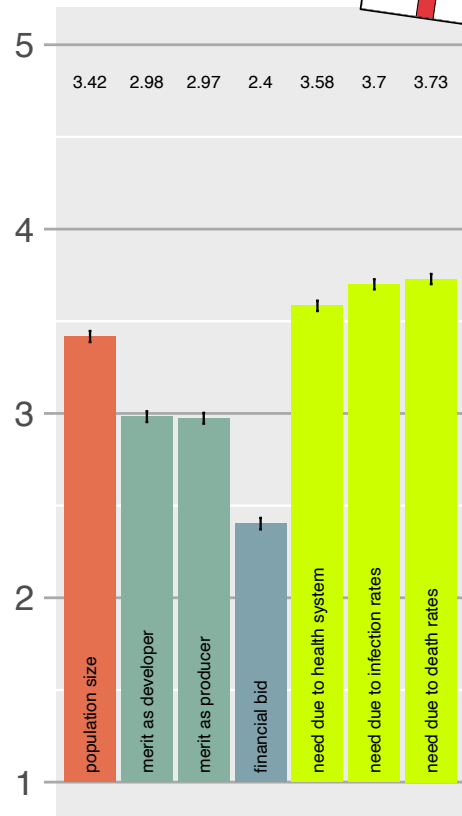
Germany, 2024  
regarding a potential future pandemic



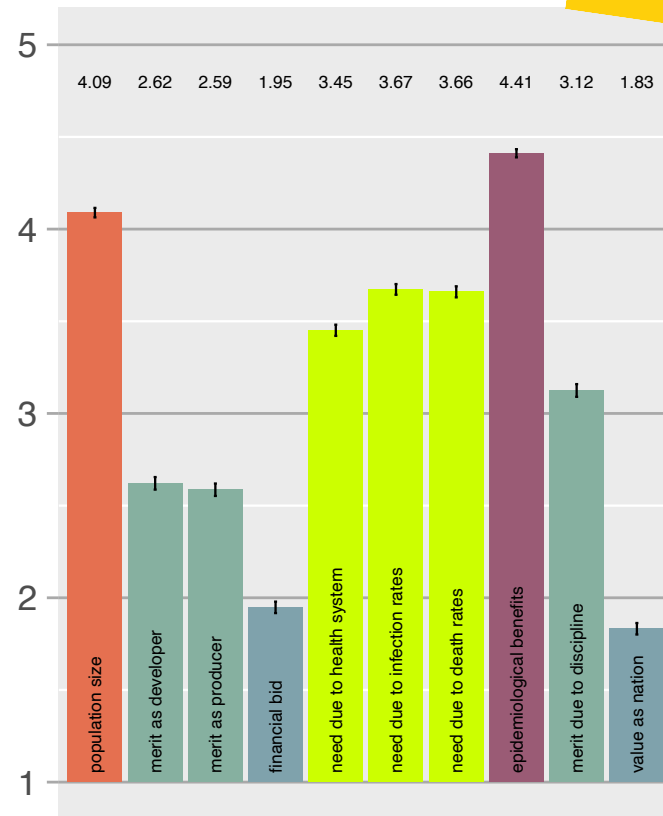
Germany, 2021  
regarding COVID-19



England, 2021  
regarding COVID-19



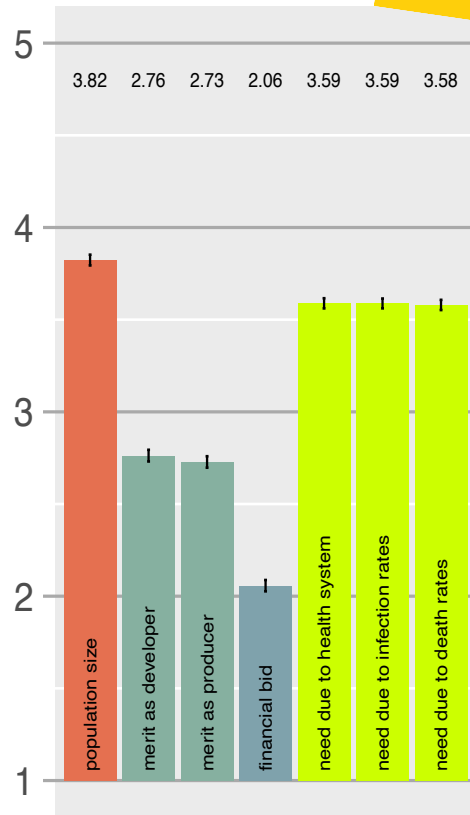
Germany, 2024  
regarding a potential future pandemic



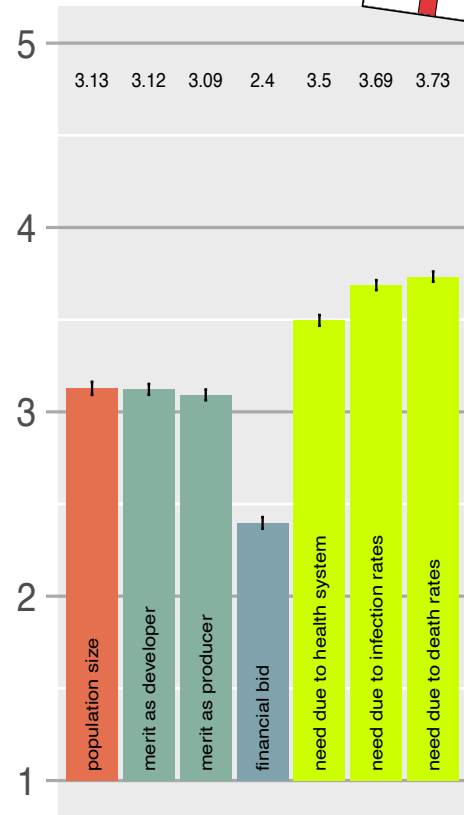
- Justice principle**
- Equality
  - Merit
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  - Need
  - Benefit maximisation



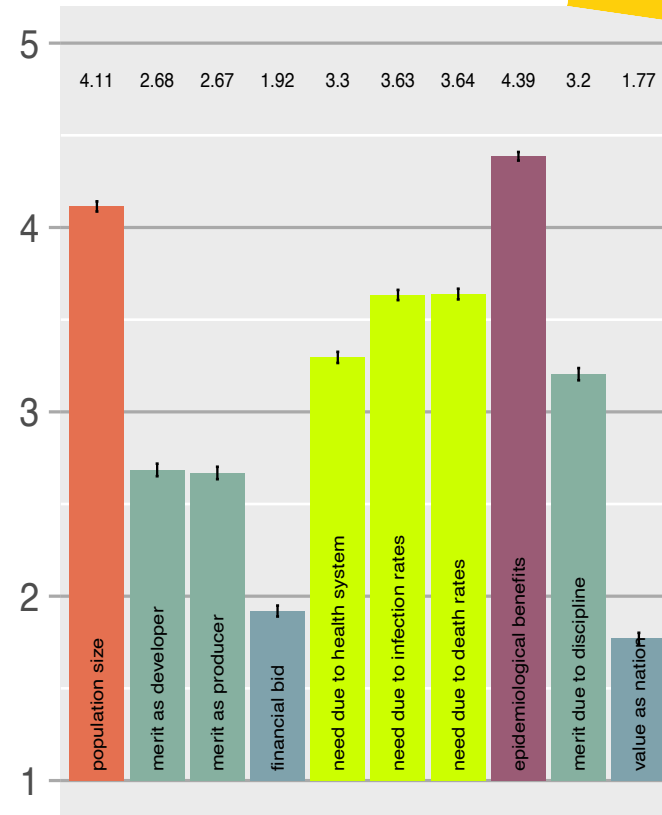
Germany, 2021  
regarding COVID-19



England, 2021  
regarding COVID-19



Germany, 2024  
regarding a potential future pandemic



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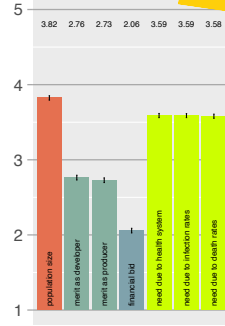


Vaccine

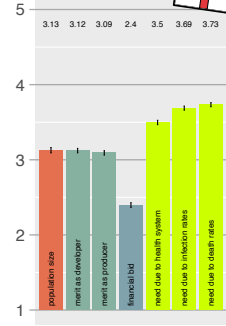
Tests

Ventilators

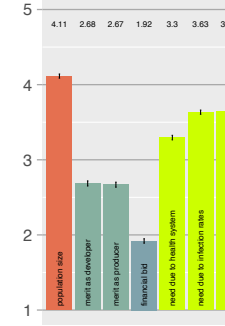
Germany, 2021  
regarding COVID-19



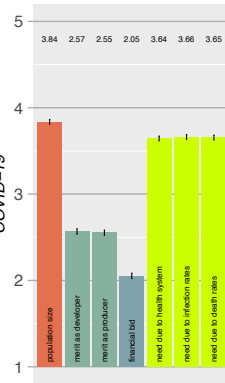
England, 2021  
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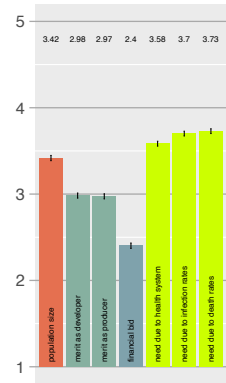
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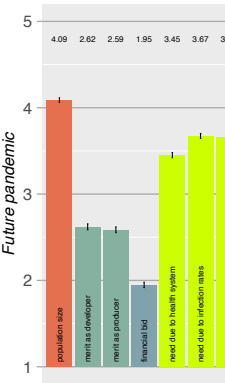
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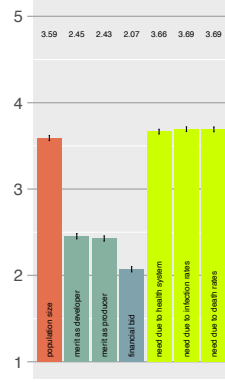
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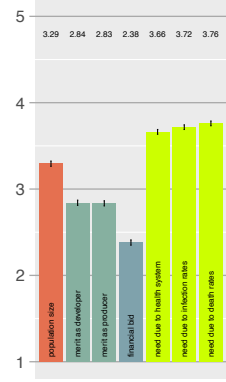
Germany, 2024  
regarding a potential future pandemic



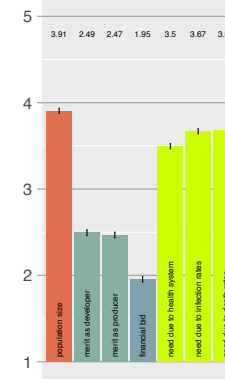
Germany, 2021  
regarding COVID-19



England, 2021  
regarding COVID-19



Germany, 2024  
regarding a potential future pandemic

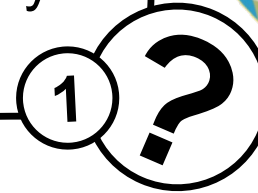


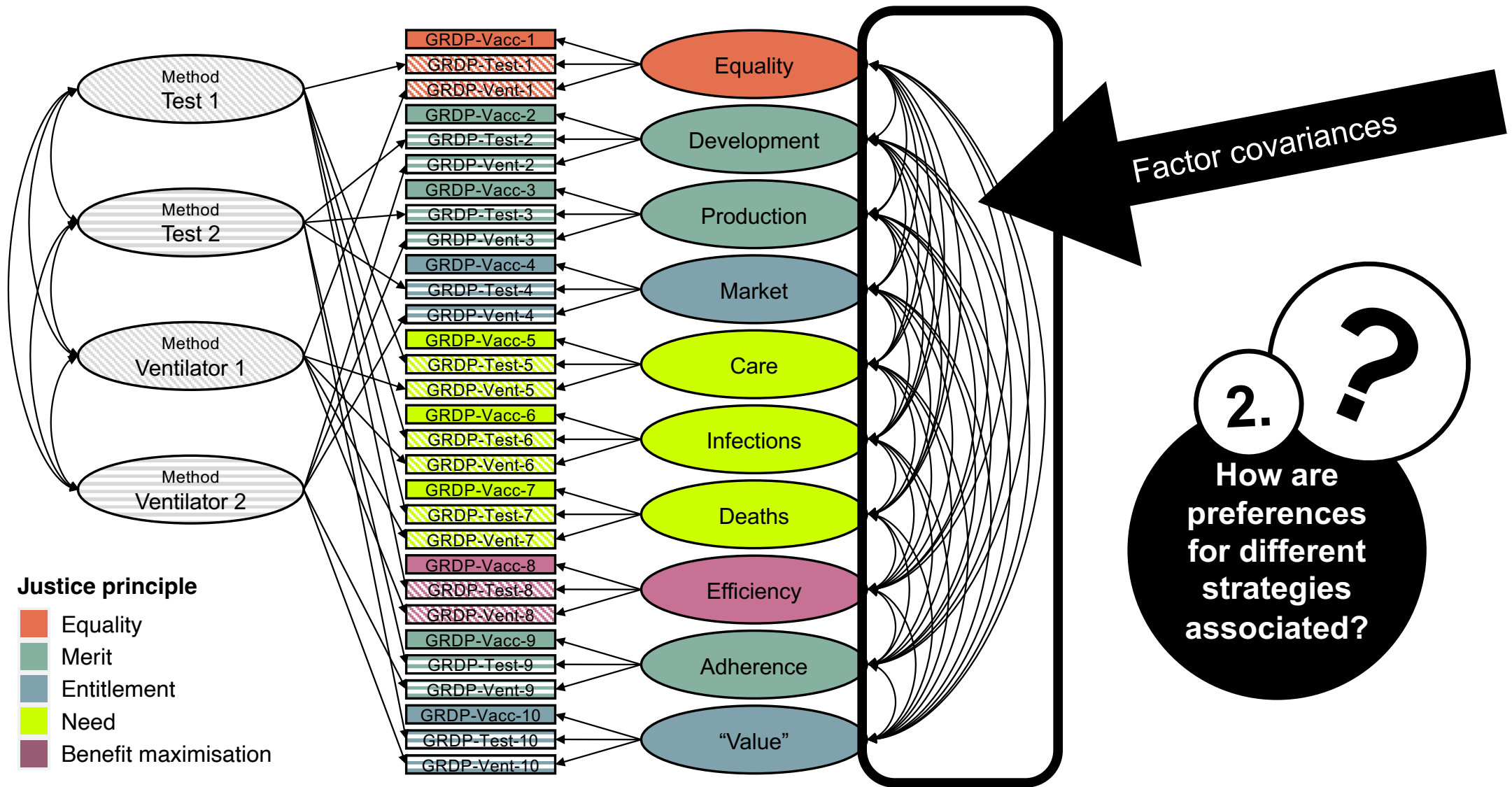
### Justice principle

- Equality
- Merit
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- Need
- Benefit maximisation

# What we have learned

Citizens in England and Germany disapprove of national protectionism in pandemics. They opt for more efficiency, equity and equality in global health resource distribution.





# Latent correlations

First cohort, 2021  
(COVID-19)



	1	2	3	4	5	6	7
1. Equality	<b>0.76</b>	-.31	-.33	-.42	.56	.54	.53
2. Development		<b>1.30</b>	.98	.57	-.14	-.10	-.08
3. Production			<b>1.28</b>	.59	-.13	-.11	-.08
4. Market				<b>0.96</b>	-.24	-.20	-.20
5. Care					<b>0.73</b>	.85	.81
6. Infections						<b>0.84</b>	.91
7. Deaths							<b>0.90</b>



	1	2	3	4	5	6	7
1. Equality	<b>0.57</b>	-.15	-.13	-.14	.42	.42	.42
2. Development		<b>1.08</b>	.97	.53	-.09	-.09	-.13
3. Production			<b>1.04</b>	.52	-.07	-.07	-.11
4. Market				<b>1.00</b>	-.19	-.21	-.25
5. Care					<b>0.75</b>	.89	.84
6. Infections						<b>0.85</b>	.96
7. Deaths							<b>0.91</b>



# Latent correlations

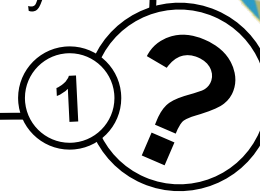
Second cohort, 2024  
(fictional future pandemic)



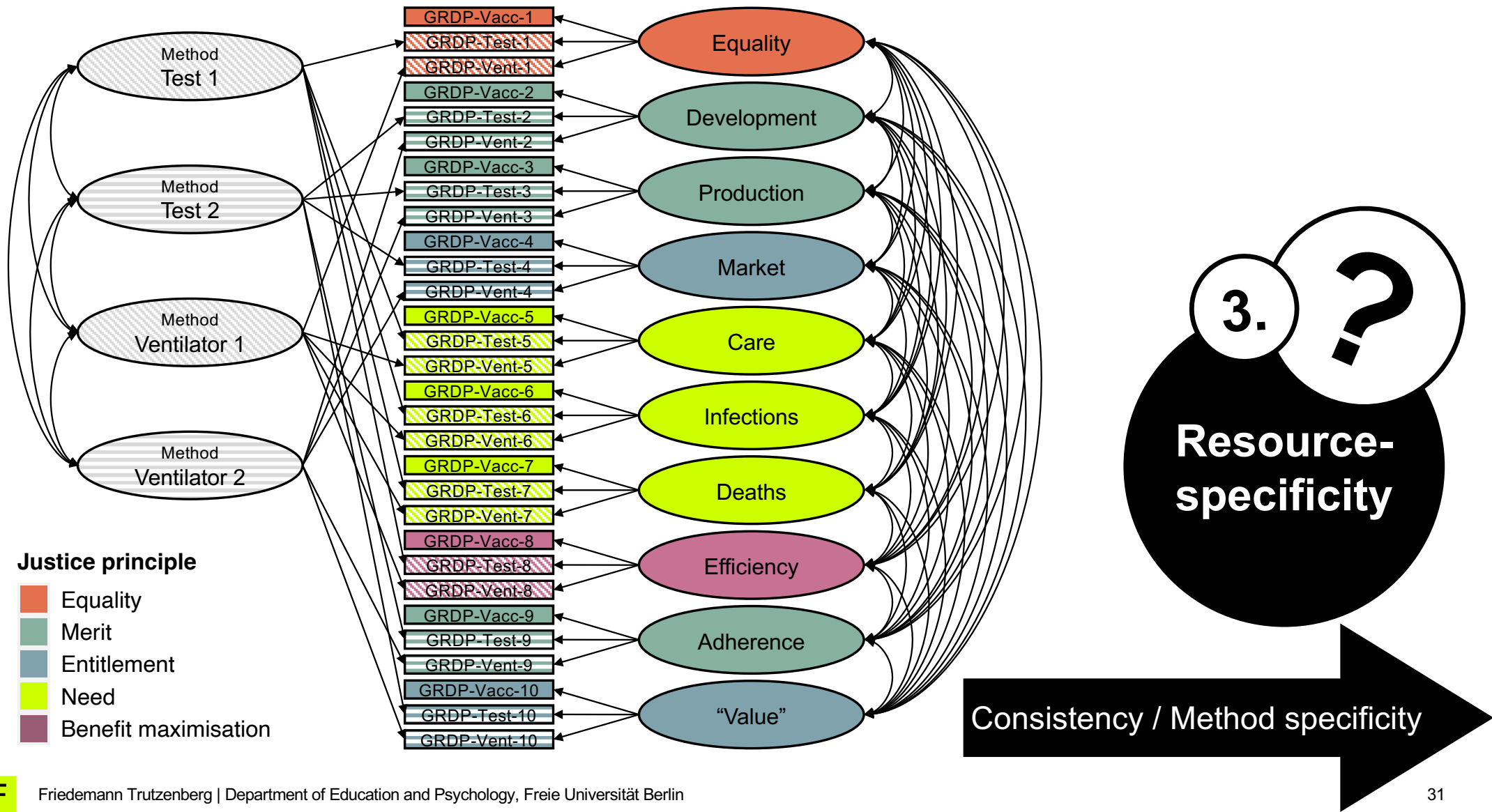
	1	2	3	4	5	6	7	8	9	10
1. Equality	<b>0.55</b>	-.33	-.32	-.40	.33	.31	.33	.64	-.06	-.33
2. Development		<b>1.25</b>	.98	.62	.00	.04	-.01	-.19	.47	.50
3. Production			<b>1.25</b>	.61	.02	.05	-.00	-.18	.48	.50
4. Market				<b>0.78</b>	-.13	-.09	-.11	-.34	.28	.61
5. Care					<b>0.68</b>	.81	.74	.32	.14	-.16
6. Infections						<b>0.70</b>	.93	.34	.21	-.12
7. Deaths							<b>0.82</b>	.35	.17	-.15
8. Efficiency								<b>0.40</b>	.07	-.40
9. Adherence									<b>0.88</b>	.36
10. Value										<b>0.78</b>

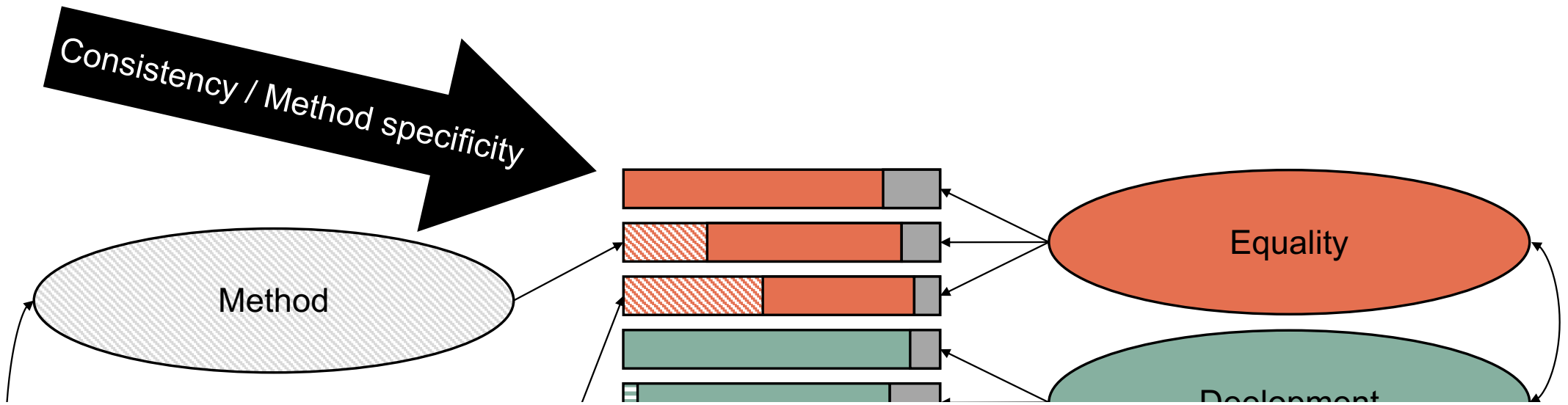
# What we have learned

Citizens in England and Germany disapprove of national protectionism in pandemics. They opt for more efficiency, equity and equality in global health resource distribution.



Preferences for different principles are related following ethical proximity.





	Observed variable	True-score variable
<b>Consistency</b>	$\text{Cons.}_\gamma = \frac{\sigma_{\text{Justice}}^2}{\sigma_{\text{Justice}}^2 + \sigma_{\text{Method}}^2 + \sigma_{\text{Error}}^2}$	$\text{Cons.}_\tau = \frac{\sigma_{\text{Justice}}^2}{\sigma_{\text{Justice}}^2 + \sigma_{\text{Method}}^2}$
<b>Method specificity</b>	$\text{Spec.}_\gamma = \frac{\sigma_{\text{Method}}^2}{\sigma_{\text{Justice}}^2 + \sigma_{\text{Method}}^2 + \sigma_{\text{Error}}^2}$	$\text{Spec.}_\tau = \frac{\sigma_{\text{Method}}^2}{\sigma_{\text{Justice}}^2 + \sigma_{\text{Method}}^2}$



# Latent method specificity (95% bootstrap CI)

	Germany 2021	England 2021	Germany 2024
<b>Equality</b>	.04 [.02; .08]	.04 [.01; .08]	.03 [.01; .07]
<b>Development</b>	.28 [.24; .33]	.47 [.41; .53]	.30 [.24; .36]
<b>Production</b>	.28 [.23; .33]	.47 [.41; .52]	.30 [.25; .35]
<b>Market</b>	.06 [.04; .09]	.11 [.07; .16]	.06 [.03; .10]
<b>Care</b>	.22 [.15; .28]	.24 [.18; .32]	.16 [.10; .22]
<b>Infections</b>	.32 [.25; .38]	.38 [.31; .44]	.28 [.22; .35]
<b>Deaths</b>	.29 [.22; .36]	.34 [.27; .41]	.31 [.25; .38]
<b>Efficiency</b>			.00 [.00; .02]
<b>Adherence</b>			.20 [.16; .25]
<b>Value</b>			.22 [.18; .27]
			.05 [.03; .09]
			.11 [.06; .14]
			.24 [.18; .31]
			.22 [.13; .28]
			.00 [.00; .03]
			.00 [.00; .00]
			.00 [.00; .00]

# Latent method specificity (95% bootstrap CI)

	Germany 2021		England 2021		Germany 2024	
<b>Equality</b>	.04 [.02; .08]	.04 [.01; .08]	.03 [.01; .07]	.05 [.02; .09]	.00 [.00; .02]	.01 [.00; .05]
<b>Development</b>	.28 [.24; .33]	.47 [.41; .53]	.30 [.24; .36]	.48 [.41; .54]	.20 [.16; .25]	.29 [.24; .35]
<b>Production</b>	.28 [.23; .33]	.47 [.41; .52]	.30 [.25; .35]	.50 [.44; .56]	.22 [.18; .27]	.31 [.26; .36]
<b>Market</b>	.06 [.04; .09]	.11 [.07; .16]	.06 [.03; .10]	.14 [.09; .19]	.05 [.03; .09]	.06 [.03; .10]
<b>Care</b>	.22 [.15; .28]	.24 [.18; .32]	.16 [.10; .22]	.26 [.20; .33]	.11 [.06; .14]	.17 [.12; .23]
<b>Infections</b>	.32 [.25; .38]	.38 [.31; .44]	.28 [.22; .35]	.37 [.31; .44]	.24 [.18; .31]	.33 [.26; .40]
<b>Deaths</b>	.29 [.22; .36]	.34 [.27; .41]	.31 [.25; .38]	.36 [.30; .42]	.22 [.13; .28]	.28 [.21; .34]
<b>Efficiency</b>					.00 [.00; .03]	.01 [.00; .03]
<b>Adherence</b>					.00 [.00; .00]	.00 [.00; .00]
<b>Value</b>					.00 [.00; .00]	.00 [.00; .00]

# What we have learned



Citizens in England and Germany disapprove of national protectionism in pandemics. They opt for more efficiency, equity and equality in global health resource distribution.

1



2



Preferences for different principles are related following ethical proximity.

3



Preferences were similar across different health care resources, but substantially resource-specific.



# Implications



## **Cooperation has got a mandate!**

Even citizens of rich Western countries opt for global solidarity and epidemiological efficiency – even in times of crisis.

### **For the next global emergency (Mpox? Bird flu?), let us...**

- implement fairer and more efficient global distribution mechanisms!
- extend existing ethics-based domestic frameworks to the global level!
- inform pandemic preparations with citizens' ethical views
  - to increase public trust and acceptance for necessary measures in difficult times!
  - to close the gap between ethical knowledge and policy!
- conduct more public opinion research in non-WEIRD countries!

# Thank you very much!

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A decorative graphic consisting of a yellow-green L-shaped frame. It has a vertical bar on the left, a horizontal bar at the top, and a vertical bar on the right. The word "References" is centered within the white space of the L-shape.

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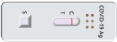





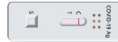

# Appendix



# Model fit

<b>Strategy</b>	<b>CFI</b>	<b>RMSEA</b>	<b>SRMR</b>
<b>Germany 2021</b>	0.992	0.034, 90% CI [0.029;0.040]	0.042
<b>England 2021</b>	0.997	0.021, 90% CI [0.013;0.028]	0.032
<b>Germany 2024</b>	0.988	0.033, 90% CI [0.029;0.036]	0.034

# Reliability

Strategy	Germany 2021			England 2021			Germany 2024		
									
<b>Equality</b>	.65	.64	.49	.34	.73	.54	.63	.67	.59
<b>Development</b>	.95	.93	.94	.95	.92	.92	.94	.93	.93
<b>Production</b>	.97	.94	.95	.93	.95	.97	.97	.98	.97
<b>Market</b>	.74	.87	.79	.76	.87	.79	.77	.85	.77
<b>Care</b>	.71	.83	.84	.68	.80	.83	.64	.81	.81
<b>Infections</b>	.87	.94	.94	.88	.92	.93	.80	.89	.87
<b>Deaths</b>	.86	.91	.89	.91	.95	.93	.87	.90	.91
<b>Efficiency</b>							.65	.75	.67
<b>Adherence</b>							.70	.84	.83
<b>Value</b>							.71	.84	.82