

Supplementary material to the paper “Causal loop diagramming of socio-economic impacts of COVID-19: State-of-the-art, gaps and good practices”

Concepts used in the reviewed CLDs

Table S1. Concepts used in the reviewed CLDs. Each row represents similar concepts from various CLDs. Gray cells denote the absence of a concept in the corresponding CLD. The rightmost column counts the number of CLDs where a concept was used.

(Sahin et al., 2020)	(Bahri, 2020)	(Klement, 2020)	(Bradley et al., 2020)	(Tonngang et al., 2020)	(Zieba, 2021)	(Wicher, 2020)	(Kontogiannis, 2021)	CLDs total
Confirmed cases		Number of positive tests	Number of cases detected	Diagnosed	Growth in number of active COVID cases		Certified infection rates	6
Panic and fear		Anxiety, panic and fear	Public outrage	Fears		Fear of illness	Panic and fear	6
	Dead population	COVID-19 deaths		Dead	Growth in number of COVID-related fatalities	Number of deaths	Dying rate	6
Awareness campaign			Effectiveness of public health risk communication	Advisories and media reports		Situational awareness	Alertness	5
			Public awareness					
Business closure	Lockdowns	Business closures		Lockdown			Lockdown policy	5
Health care worker load	Occupied health facilities			Occupied health facilities		Impact on healthcare system	Hospital strain	5
	Shortage of health facilities			Shortages			Medical staff attrition	
Unemployment rate	Unemployment	Unemployment rate		Unemployment			People out of work	5
		Infected population	Number of infections people	Infected		Number of infected	Infectious population	5
		Social distancing	Number and effectiveness of policies to reduce interpersonal contacts	Social distancing		Avoidance of public space	Social distancing	5

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		and isolation						
GDP	GDP			GDP			GDP loss fraction	4
Government's stimulus package	The government aid for affected citizens			Monetary Stimulus			State sharing of costs	4
Health services capacity				Health system	Effectiveness of public healthcare system		Healthcare preparedness	4
							Capacity to respond	
International travel restrictions		International travel restrictions		Travels			Infection rate picked up from overseas	4
Interventions		Policy interventions			Government imposed restrictions	Number of interventions for stopping disease		4
Social interaction			Frequency of interpersonal contacts			Contact rate	Individual contact rate	4
Testing campaign		Testing campaigns		Screening volume			Test quality and availability	4
Trust in governments			Trust in authorities		Trust in government		Trust in authorities	4
	Isolated population			Isolated		Quarantining rate	Quarantined rate	4
	Self quarantine							
			Number of susceptible people	Susceptible	Susceptible population		Susceptible population	4
			Public perceived risk	Public perception of risk	Perceived seriousness of COVID crisis	Public attention towards COVID-19		4
Economic activities		Economic activities					Fraction used of business capacity	3

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Misinformation and fake news						Number of fake news about COVID-19	Misinformation and fake news	3
Restrictions on business		Business restrictions			Negative impact of COVID on business performance			3
Stability of supply chain				Supply chain disruption			International supply chain shortages	3
							Supply chain effectiveness	
							Limits due to supply shortages	
							Limit due to supplies	
Vulnerable populations	Severe/acute diseases			Chronic conditions				3
				Risk factors				
	The immune system	Functioning immune system		Immune system				3
	New health facilities/personnel			Health interventions			New hospitals	3
							New investment in healthcare	
							Building temporary hospitals	
	Recovered population			Recovered			Recovered population	3
		Immune population		Vaccinated			Immuned population	3
			Number of cases detected through case-finding and contact-tracing	Contact tracing			Testing-Tracking	3
Speed of government actions		Speed of government actions	Accountability of authorities					3
			Risk of transmission from per interpersonal contact			Chance of getting infected	Probability of transmission	3

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Air pollution		Air pollution						2
Hygiene practice						Level of hygiene		2
International trades		International trades						2
Level of goods and services							Shortages of goods and products	2
Mental well-being		Mental well-being						2
Non-infected population		Non-infected population						2
	Human mobility			Mobility				2
	Employment			Employment				2
	Aggregate demand			Total demand				2
	Government spending			Spending				2
	Capital			Capital				2
	Permanent income			Income				2
	Investment			Investment				2
	Consumption			Consumption				2
	Infected droplets or surfaces		Environmental contamination					2
	Symptomatic population			Symptomatic				2
	Asymptomatic population			Asymptomatic				2
		Face masks in public		Wearing masks				2

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Culture shift								1
Level of effectiveness of government health crisis actions								1
Productivity								1
Racism								1
Stability of education system								1
Stability of transportation industry								1
Trust within communities								1
Waste generation								1
		Solar UV-B radiation						1
		Financial toxicity						1
		Conflicts of interest						1
			Risk of transmission from environment					1
			Frequency and effectiveness of environmental cleaning					1
			Perceived number of infectious people					1

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			Stigma					1
			Novelty					1
				Diverse services				1
				Digital channels				1
				Return				1
				Reecent stock price				1
				Price appreciation				1
				Stock price				1
				Socio-economic status				1
				Cash reserves				1
					Popularity of traditional mass media			1
					Trust/Perceived credibility of social media			1
					Popularity of social media			1
					Impact of traditional mass media			1
					Impact of social media			1
					Personal COVID-related experiences			1
					Seriousness of COVID crisis			1
					Business actions aimed at survival & development			1

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						Rate of attention growth		1
						Demand for media coverage on COVID-19		1
						Number of deaths reported		1
						Budget for fight the COVID-19		1
						Media interests on COVID-19		1
							Mass-production	1
							Development of vaccines	1
							Production with promising but not yet certified vaccine	1
							Infection rate	1
							Admission rate	1
							Recovering rate	1
							Multiple perspectives on policy criteria	1
							Test quality	1
							Concerns about data reliability & prognostic models	1
							Fatality rate	1
							Social pressure	1
							Isolation effectiveness	1
							Anticipation of bottlenecks	1
							Reports on demands & resources	1
							Centre for Disease Control	1

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							Research Institutes Mobilisation	1
							Population sampling	1
							Data reliability	1
							Relaxation of protocols & evidence	1
							New systems for validating & sharing treatments	1
							Local efforts to use new treatments	1
							Q-H dilemma	1
							Morbidity in recovered patients	1
							Backlog of other patients	1
							Defer care for other patients	1
							Efficient treatments	1
							Reconfigure resources & PPE	1
							Reconfigure teams	1
							Mobilisation of other agents	1
							ICUs/PPE stock/ventilators	1
							Synchronisation of effort	1
							Mobilisation of policies	1
							Redirecting manufacturing of products	1
							Ventilator stock	1
							Q-H policy	1

Distributions of in- and out-degrees of the components of the reviewed CLDs

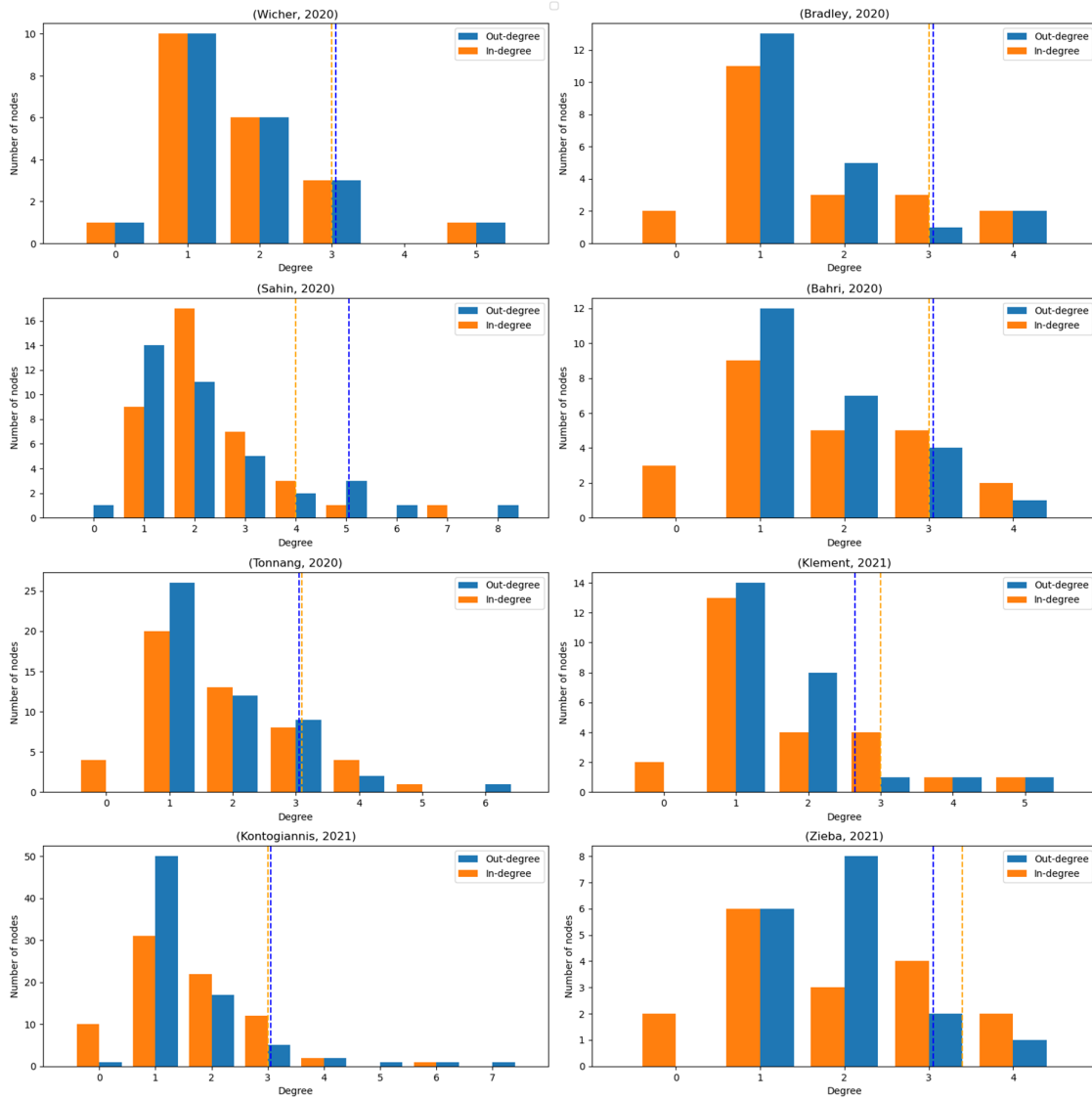


Figure S1. Distributions of in- and out-degrees for each reviewed CLD. Vertical dashed lines denote the top decile of the corresponding distributions, i.e., the blue one of the out-degree distribution and the orange one of the in-degree distribution.