



### How to increase robustness in Step 4 and manage complexity to ascertain impact





### Insights-audit trail of FATE steps

Step	Social Technical System	Current		Baseline	
1	People (OPPPTI)	<ul> <li>Big Pharma corruption</li> </ul>		Big Pharma corruption	
Step 2	Scenario		Social (TEMPLES)		
	1 – A World Adrift		Social-credit style access to healthcare		

Step 3	People (OPPPTI)/ Social
	Conspiracy theories about Big Pharma and use by the rich

Step 4	Impact on defence and security	Possible Responses	Time to respond	Game- changingness	Regret	(Likelihood)
	Forces health, but not hugely different from wider population	Tightening of world trade and competition rules and standards	Can respond	Not GC	Some regret	Likely





# Problem: Doing stuff in our head is quick, but it's easy to miss things and is <u>opaque</u>

Scenario	Insights (& relevant influencing factors)	Impact on defence and security		Time to respond	Game- changingness	Regret	Likeli- hood
1	Conspiracy theories about Big Pharma and use by the rich	Forces health, but not hugely different from wider population	world trade and competition	Can respond	Not GC	Some regret	Likely
1	People frightened to share personal data	Recruitment of personnel more difficult	New incentives to join up	Can respond	Not GC	No regret	Highly likely
2	People want solutions to pandemics and aging	Social unrest and Gov' action	new military tasks	Cannot respond in time	GC	Regret	Likely





# This is the plan

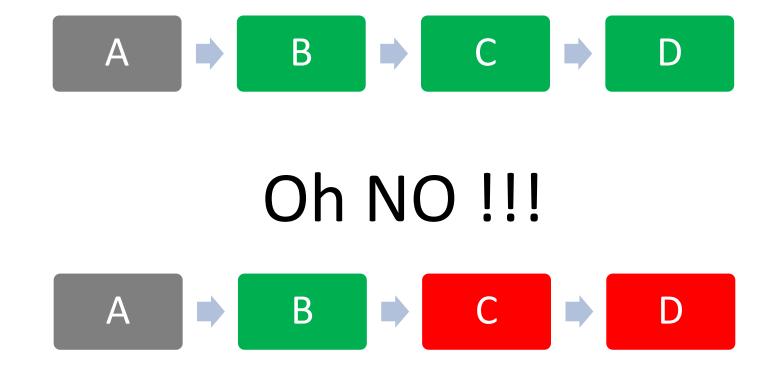


The veil of the future

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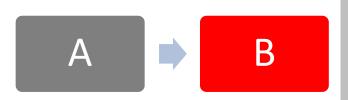








## This is a bad idea

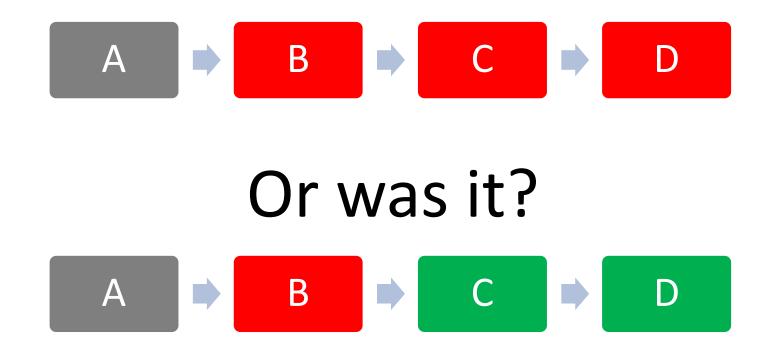


The veil of the future

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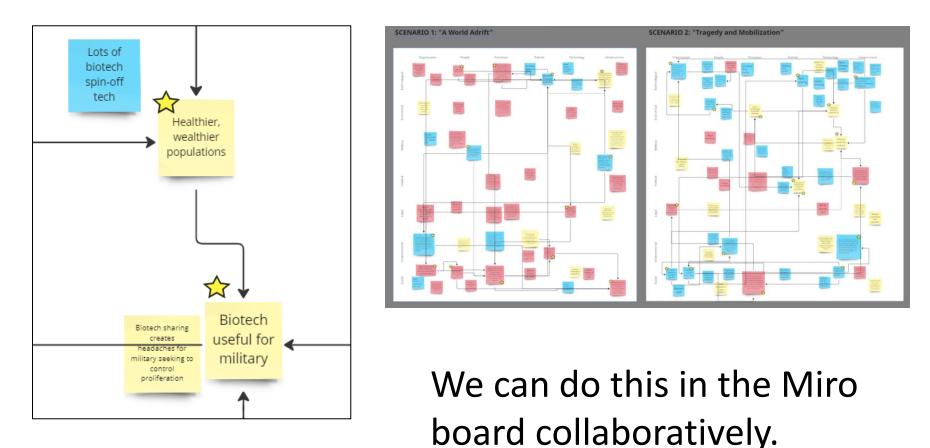
### We are part of a greater system







### Identify connections





- COLLABORATION SUPPORT OFFICE
- Complexity of connections increases exponentially

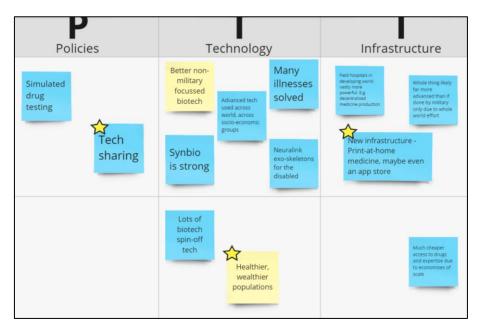
SCIENCE AND TECHNOLOGY ORGANIZATION

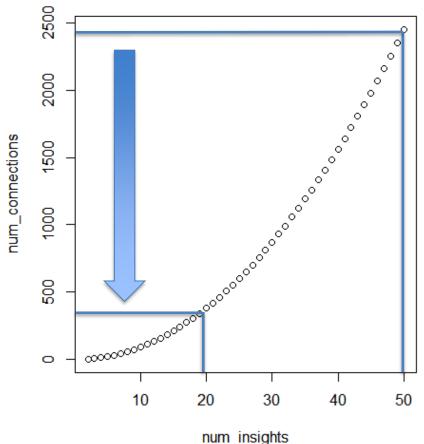
- Combine similar ideas and down-select the most interesting nodes (by putting stars on them)
- Look for connections

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Time consuming - sorry

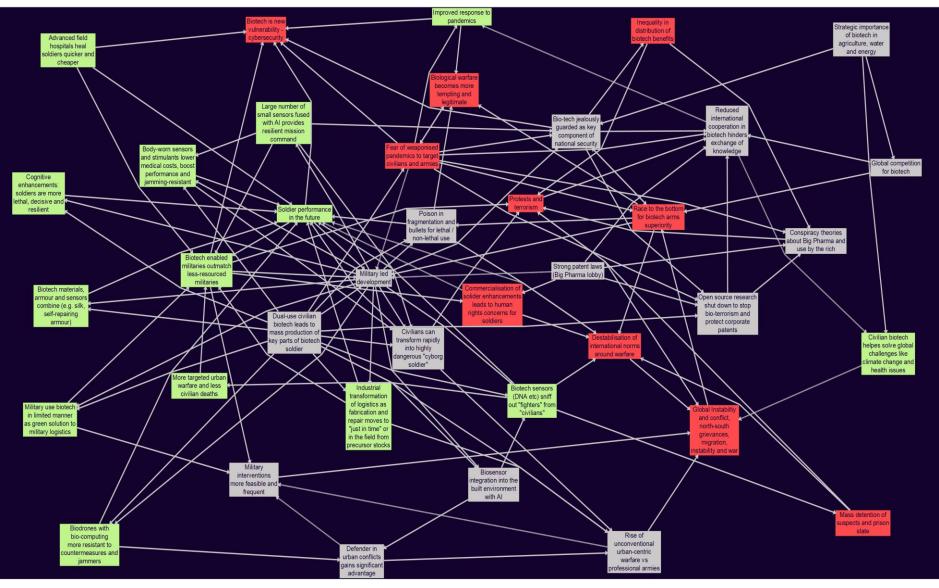




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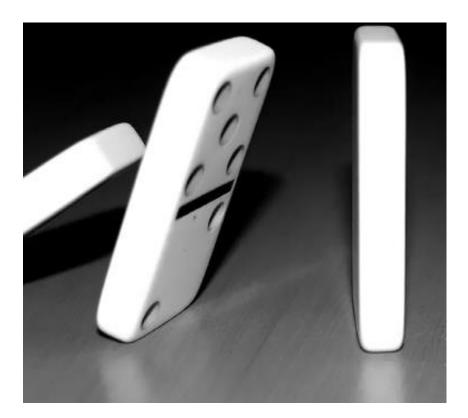


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### Chains of catalysis Not definitive cause and effect

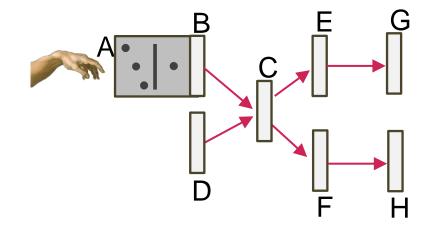


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### Algorithm

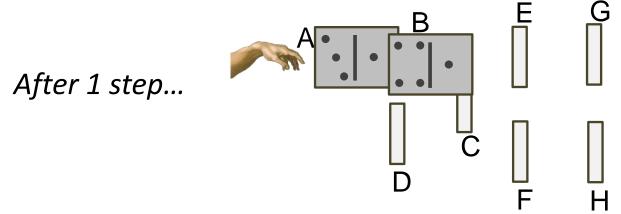


Start with A





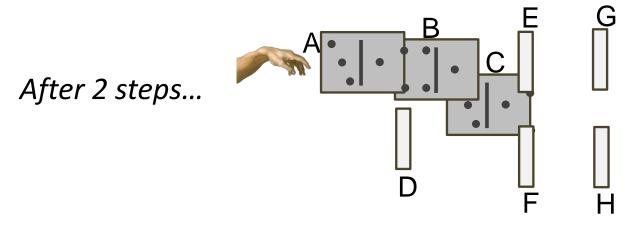
### Algorithm







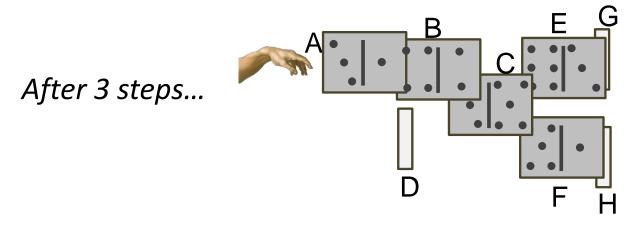
### Algorithm







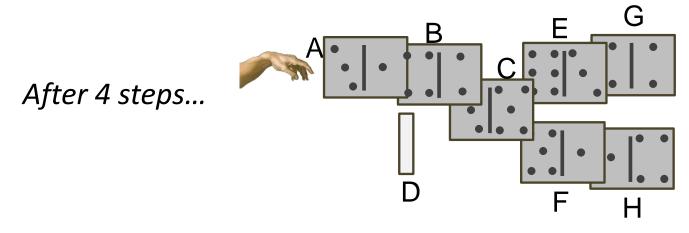
### Algorithm







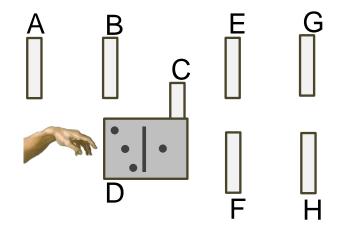
### Algorithm







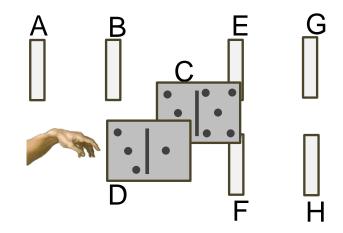
Go through each domino in turn...







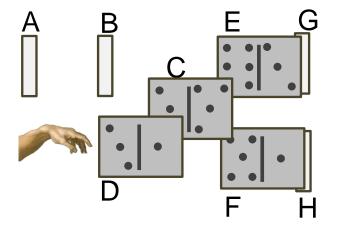
After 1 step...







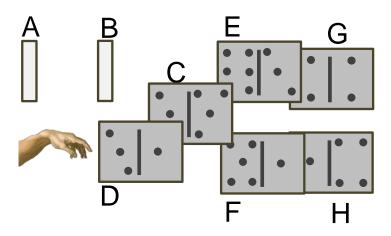
After 2 steps...





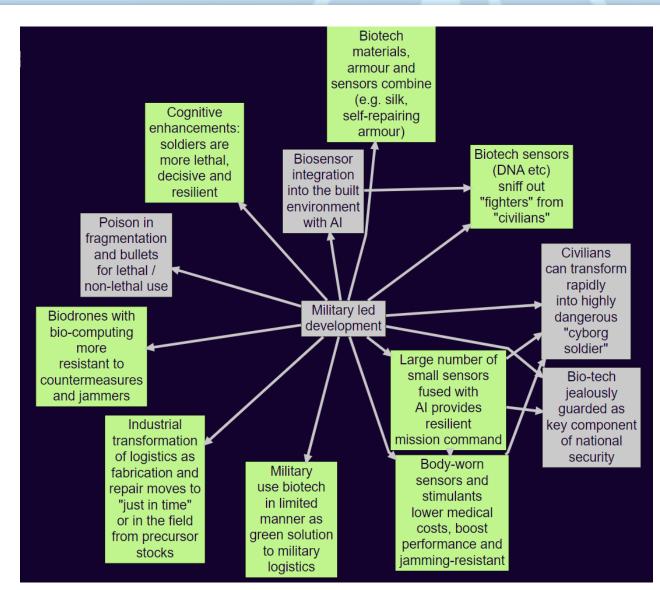


After 2 steps...









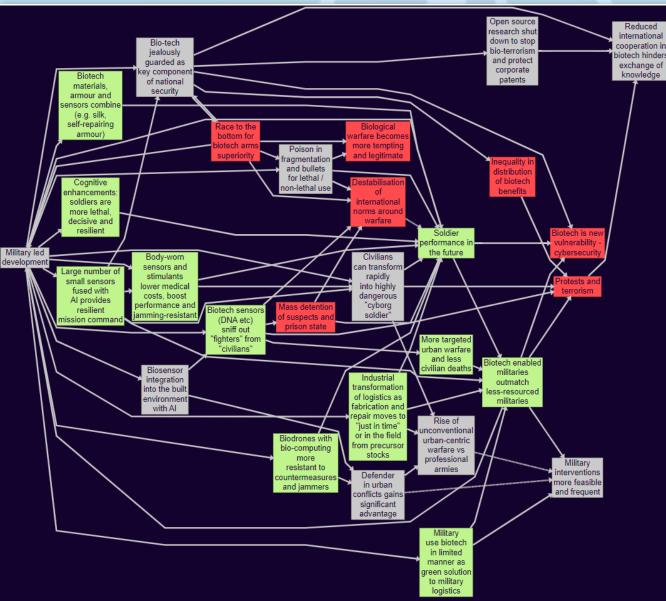
First order consequences of military led development of biotech all good.

Let's sign off on the \$10 billion now?

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Military led development of biotech also helps catalyse 2<sup>nd</sup> order issues

Would we regret the military developing biotech? Can we de-risk?

- Mass detention via enemy-sniffing sensors
- Biotech frag upsets norms
- Soldier human rights
- Civilians turn into lethal biotech cyborgs increasing terrorism & guerrilla warfare
- Biotech a new vulnerability
- Biotech armies superior
- Advanced hospitals
- Easier to find the enemy?

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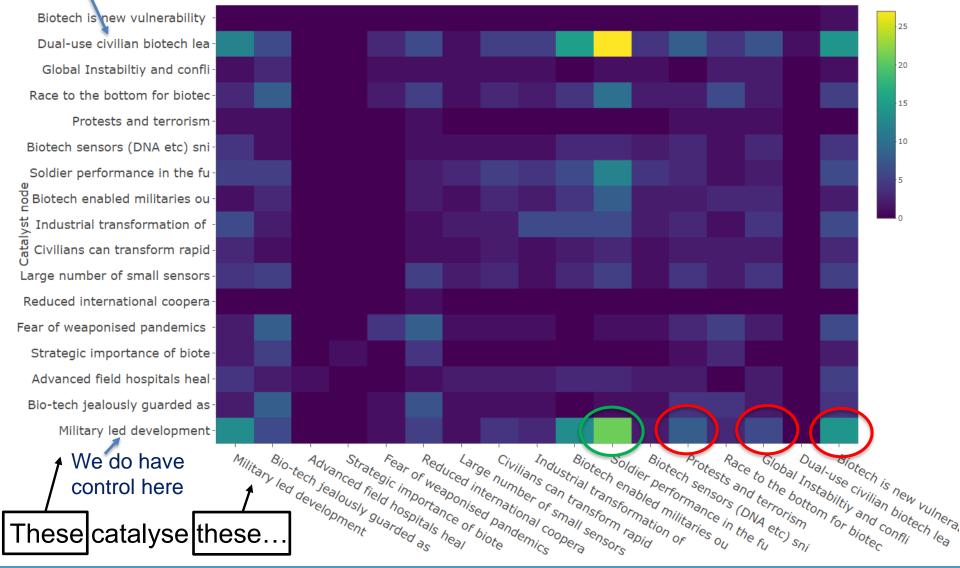
15

10

5

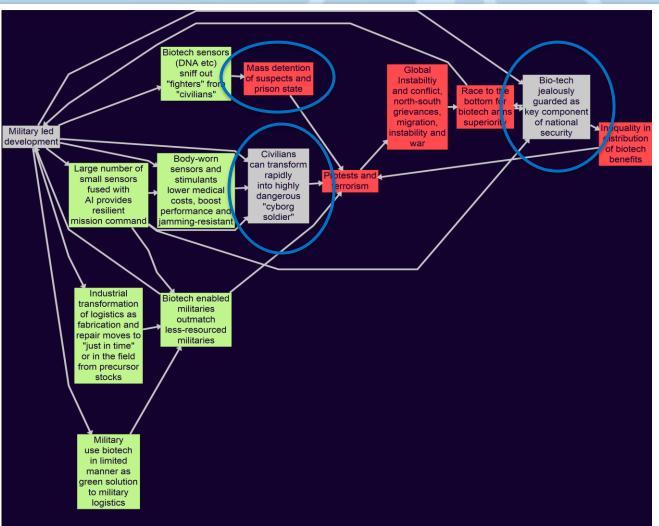
### We have little control here

Influence map for 3 degrees of influence









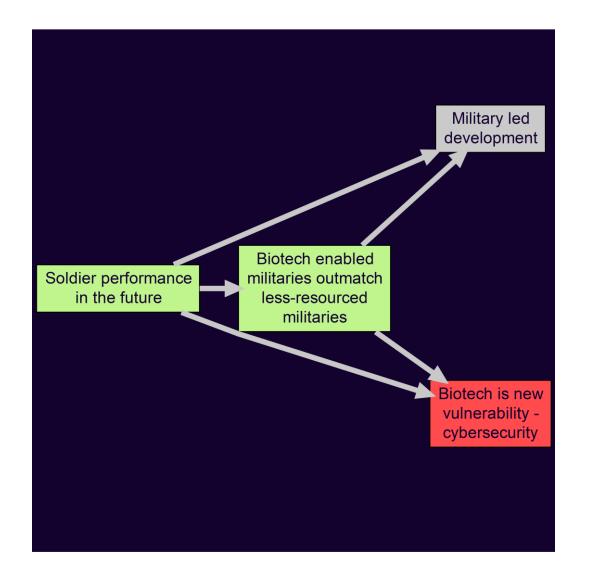
Examining causal chain:

"How does militaryled development catalyse protests and terrorism?"

Can we mitigate these?







Would we regret improved soldier performance if we got it?

- Biotech is new vulnerability
- Biotech armies superior

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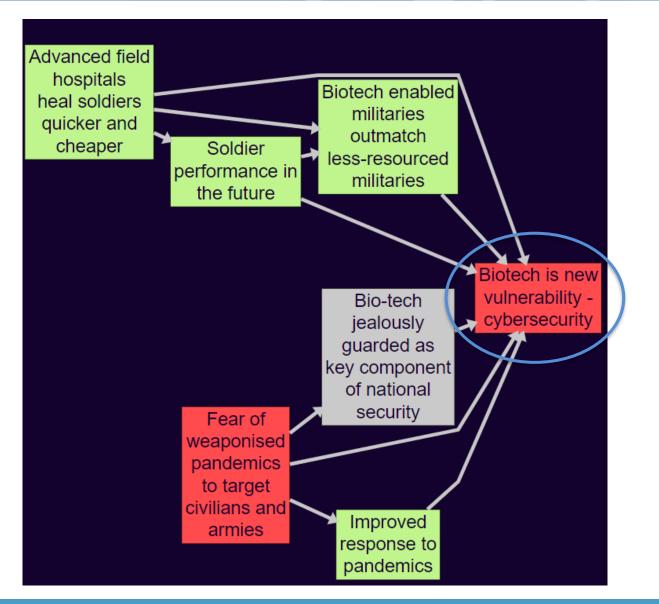


Influence map for 3 degrees of influence

Biotech is new vulnerability 25 Dual-use civilian biotech lea-20 Global Instabiltiy and confli-Race to the bottom for biotec-15 Protests and terrorism 10 Biotech sensors (DNA etc) sni-Soldier performance in the fu-5 Biotech enabled militaries ou-Large number of small sensors -Reduced international coopera-Fear of weaponised pandemics Strategic importance of biote Advanced field hospitals heal Bio-tech jealously guarded as-Military led development-Bio-tech jealously guarded as Advanced Field hospitals heal Strategic importance of biote Fear of Weaponised Dandemics Reduced international coopera Large number of small sensors Industrial transformation of Biotech enabled militaries ou Soldier performance in the fu Biotech sensors (DNA etc) snj Race to the bottom for biotec Global Instability and confil Dual-use civilian biotech lea Military led development Civilians can transform rapid These catalyse these.

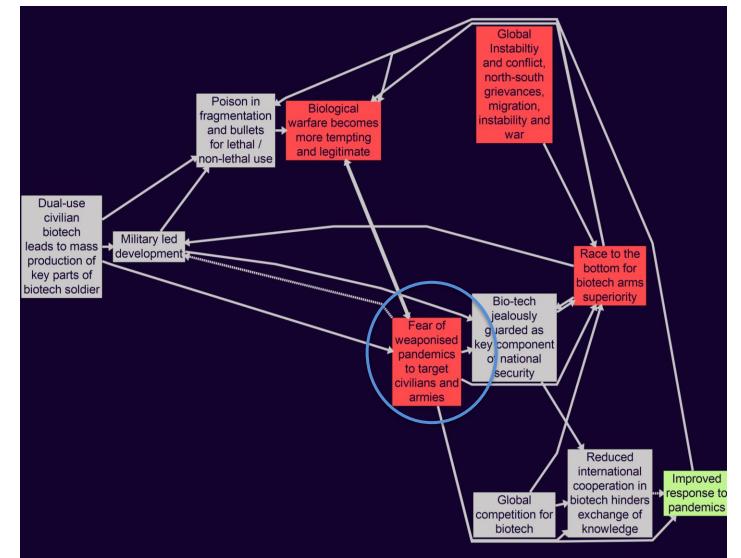






Causal chain behind biotech being a new vulnerability





Causal chain behind weaponised pandemics

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Linkages sadly not optional

Unintended consequences too severe

Explore wider world and expose gaps in thinking

Use network tools for complex graphs

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