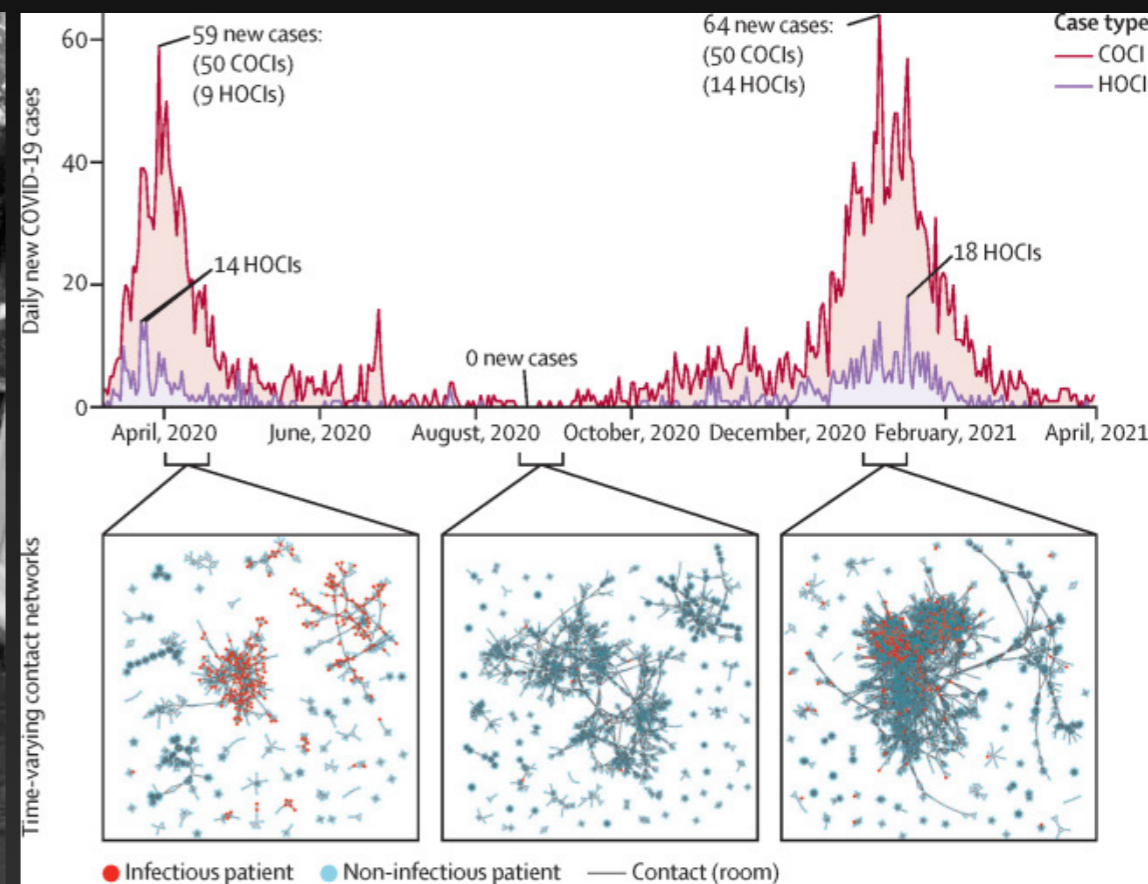


Out of the lockdown into the halls

Julia Brettschneider, 5.12.2022

A dysfunctional system within a complex system

Isolation experience in lockdown



https://www.huffingtonpost.co.uk/entry/this-is-what-lockdown-looks-like-to-teenagers_uk_5eb40051c5b6526942a2d421

<https://www.thelancet.com/journals/landig/article/PIIS2589-7500%2822%2900093-0/fulltext>

Current first years

What experience do they bring?

UK

15 years - Y9 - 2018/19 normal

16 years - Y10 - 2019/20 lockdown from mid March

17 years - Y11 - 2020/21 lockdown at varying intensity

18 years - Y12 - 2021/22 semi normal, f2f exams

China

Regional differences

Longer quarantine

Earlier introduction of masks, testing

Continued lockdown in major cities

Teenage development

Characteristics:

- More autonomous from parents (control over their lives, identity, interests, style)
- More time with peers
- Romantic/sexual relationships/orientation



Most of these incompatible with lockdown

In particular: limited observation of peers to shape personal norms, e.g. guiding risk taking and prosocial behaviour

<https://www.nature.com/articles/s41598-021-92482-8>

<https://www.nytimes.com/2021/05/04/opinion/coronavirus-mental-health-teenagers.html>

Which unusual behaviour have you observed in you tutees, children, neighbours, friends, relatives, colleagues...?

- ...
- ...
- ...

Which unusual behaviour have you observed in you tutees, children, neighbours, friends, relatives, colleagues...?

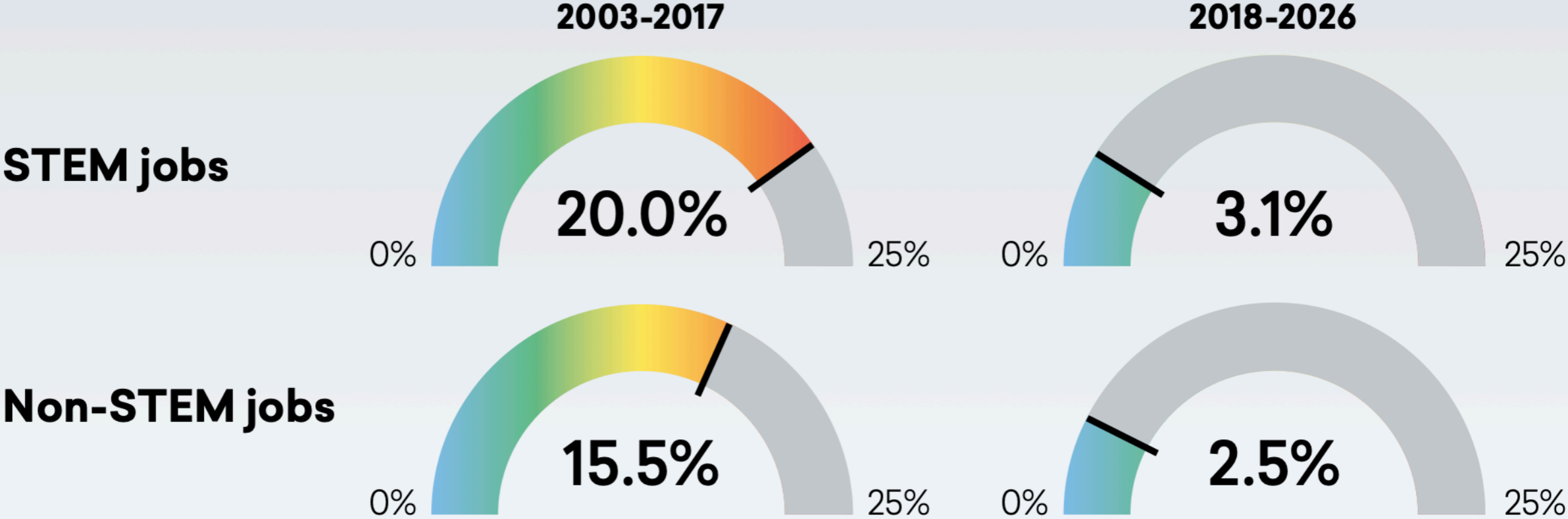
- Uncertainty around interaction
- Passive attitude
- Self-confinement to small geographical area
- Fear of many every day activities (taking the bus, eating out...)
- Repeated inquiries about rules

Employers want STEM

- CBI survey showing that 40% of employers reported a shortage of STEM graduates as being a key barrier in recruiting appropriate staff (2017)
- High level STEM skills key to performance of the UK economy, as in jobs, productivity, innovation, competitiveness (UKCES, 2022)

Find the main factor for growth in jobs

A comparison of historic and projected growth in STEM and non-STEM jobs throughout Britain from 2003-2026



(never mind)

Employers want it all



SKILLS GAPS

Critical thinking

Managerial/supervisory

Communication/interpersonal

Leadership

Creativity/innovation

Proc. Improv./proj. management.

Managing/leading remotely

Technical skills

IT skills

Source: STEM-GC slide shows 2021+
stem.org.uk

**The lockdown cohorts may have
less of these skills**

Lockdown cohorts

- Isolation experience
- Online vs physical environment
- Self organised
- Resilience, self reliance, persistence... - selection bias
- Mental health problems up (increased around 20-35%), mostly anxiety and depression

On the other hand...

A dysfunctional system within a complex system

What may this describe?

A dysfunctional system within a complex system

Wicked problem

1. The problem is not understood until after the formulation of a solution.
3. Wicked problems have no **stopping rule**.
5. Solutions to wicked problems are **not right or wrong**.
7. Every wicked problem is essentially novel and unique.
9. Every solution to a wicked problem is a "one shot operation".
11. Wicked problems have no given alternative solutions.

Examples for wicked problems

International crime

Climate change

Terrorism

Natural hazards

Poverty

Pandemics

Examples for wicked problems

International crime

Climate change

Terrorism

Natural hazards

Poverty

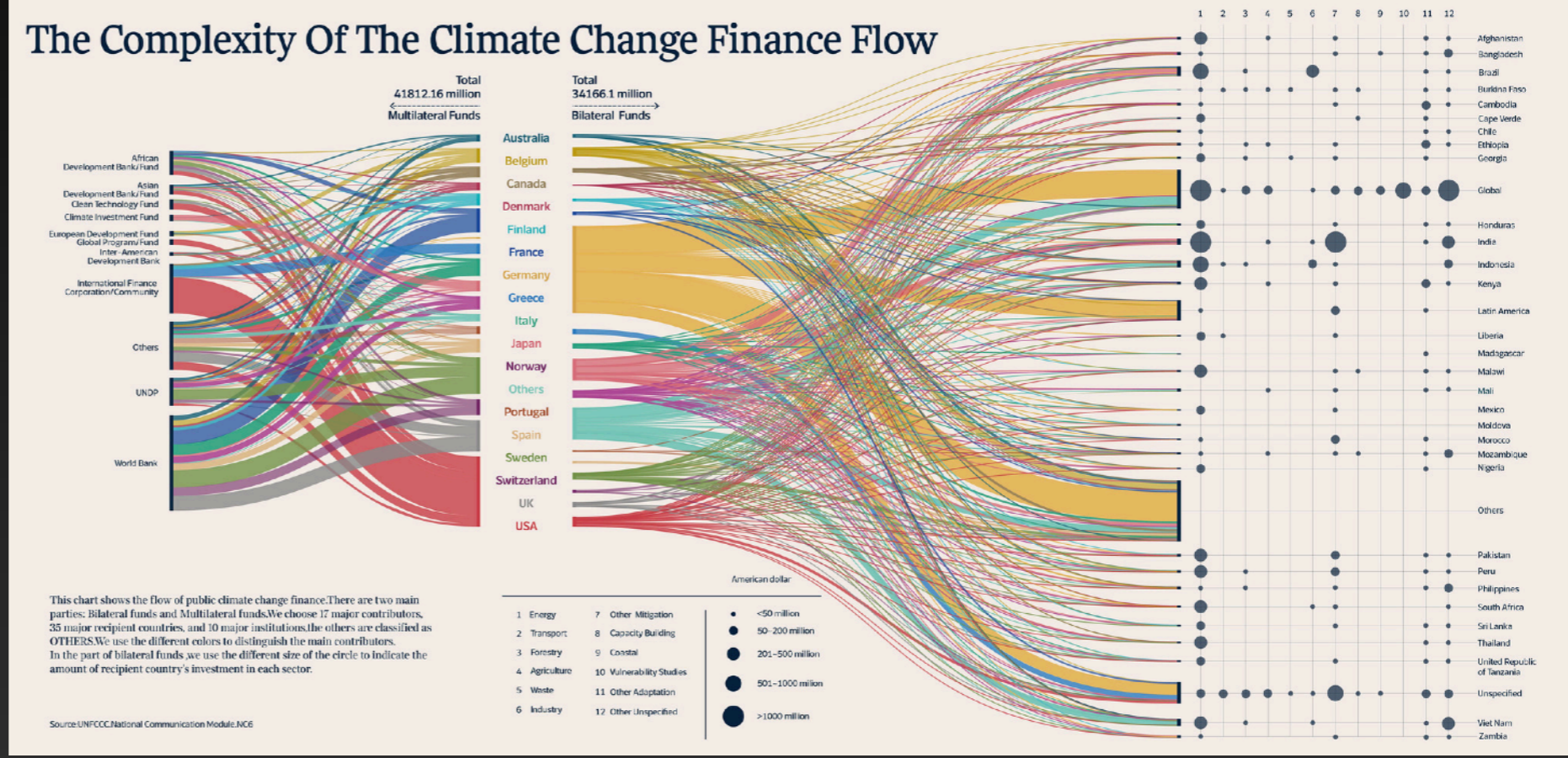
Pandemics

(Subjective:) Transition to university

Regular problems



Wicked problems



Can you think of wicked problems?

Anything local, for example?

- ...
- ...
- ...

New curriculum module without exam

Content: Introduction to Statistical Thinking & teaching R

Possible social constallations:

- **Cohort**
- **Individual**
- **Working group**
- **Personal tutor group**
- **Spontaneously formed or friendship group**

ST117 Introduction to Statistical Thinking and R: assessment & activity plan

Time	Assessment/activity	Mode	Marker	About	Lecture: Mon (1h) + Tue (2h)	Tutorial: Tue (after lecture)/Wed/Thu/Fri	Independent work	Written communication
T1 1	Activity: "Collect!"	Gr.	none	Collecting data (on paper) experience	Philosophy of statistics, reasoning under uncertainty, models, EDA, visualisation	No lab	Install R studio "Collect!"	Guidance "Collect"
2	Activity: "Collect!"		none	Students sample, upload, creating "Collect!"	Basic R, data types, plotting, simulations, functions	Install R studio, practice using your "Collect!" data	Practice using R prepare questions	Guidance Quiz R cheat sheets/tutorials
3	Quiz 1 online Wed	Indiv.	Auto	Lec W1/2	Joint distr. of i.i.d. RV, sampling likelihood of i.i.d. obs., likelihood principle	Sampling var. using "Collect!"	Practice for quiz	Hand out Ex 1
4	Ex 1 Fri noon	Gr.	GTAs	Lec W1/2/3	Likelihood: why, max. scalar fcts. , plots, decay around max	Visualisation using "Collect!"	Ex 1	Guidance " aRt "
5	Activity: " aRt "	Gr.	Peer/GTAs	Data visualisation: truthful vs lying	MLE, bias, MSE, bias/variance trade-off, sampling distribution of estimator	Feedback Ex 1	" aRt "	Hand out Ex 2
6	Ex 2	Gr.	GTAs	Lec W4/5	Relative likelihood, model fit	Theory and R: Likelihood	Ex 2	
7					Regression: assumpt. , MLEs, graph. assmt. , Simpson's paradox,	Feedback Ex 2	Practice for quiz	Hand out Ex 3
8	Ex 3 Fri noon	Gr.	GTAs	Lec W6/7	Polynomial regression and cross-validation	Theory and R: Regression	Ex 3	Guidance "Connect2"
9	Activity: "Connect2"	Gr.	Peer/GTAs	Find spurious correlations	Analysis objective and model, inference pipeline, variable organisation, data QC, initial analysis, communication, data analysis cycle, R markdown	Feedback Ex 3	" Connect2 " Read project assignment and generate questions	Reminder about quiz Project assignment
10	Quiz 2 online Wed	Indiv.	Auto	Emphasis on Lec 8/9, but previous weeks relevant	Ethics (trustworthiness, reproducibility, representativeness), ethics case studies, project management concepts and tools, project report Q &A (subm./live)	Discuss written report	Practice for quiz	Assessment criteria for project
T2 1	Project report indiv. draft	Ind.	Not marked, peer disc.	Data analysis project		Catch up presentations		
3	Project report group	Gr.	Leader + colleague	Data analysis project				

Comments?

Anticipated benefits and risks?

- ...
- ...
- ...

New curriculum module without exam

Content: Introduction to Statistical Thinking & teaching R

- **Cohort:** Lectures, computer labs
- **Individual:** multiple choice quizzes (online), revision, thinking about homework/report, present a solution in the lab
- **Working group:** preparing homework/report solutions
- **Personal tutor group:** activities 1, 2
- **Spontaneously formed or friendship group:** activity 0, small tasks/discussions in between lectures, revision, brainstorming about homework/report



Recipe: <https://www.instructables.com/Sierpinski-Triangle-Fractal-Cookies/>