Scientific collaboration in a changing world

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12 February 2026

McGill

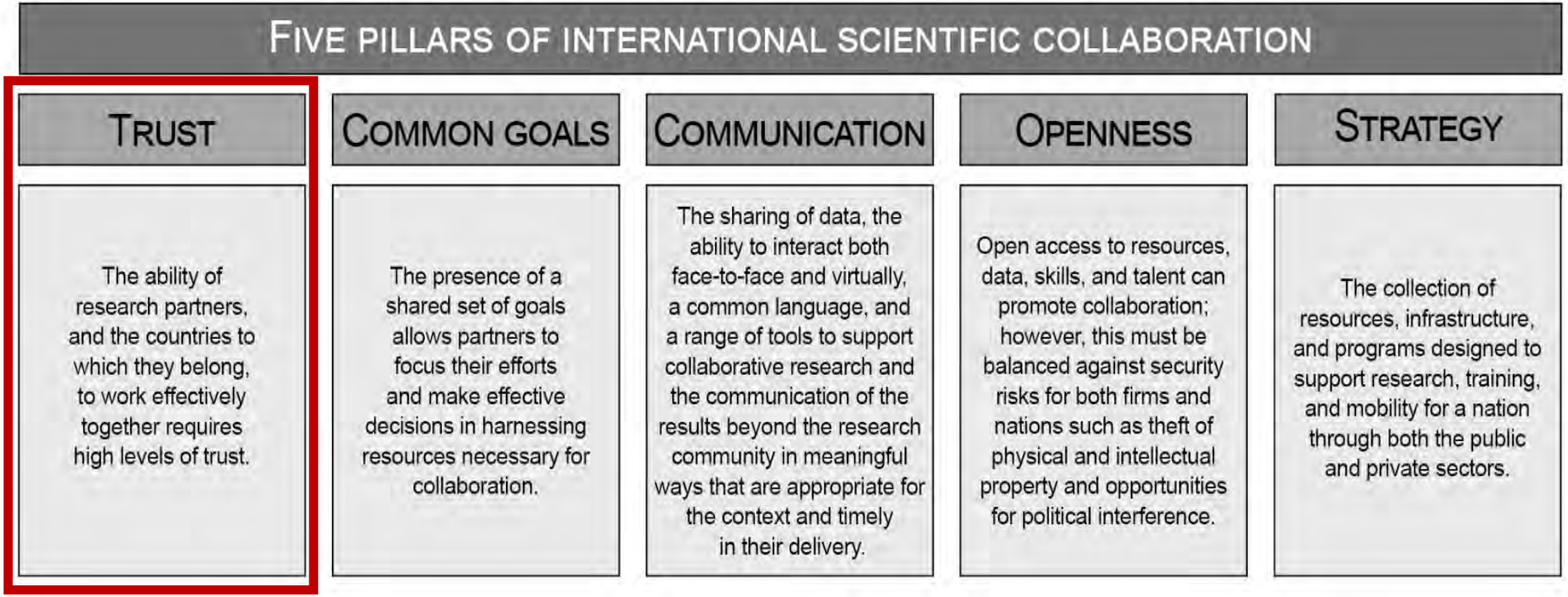
The need for international cooperation in science has never been greater

- Urgent global challenges around climate, energy, and public health
- No single country possesses sufficient expertise to address these challenges domestically
- Effective responses require overcoming barriers to international collaboration

Key barriers to international collaboration

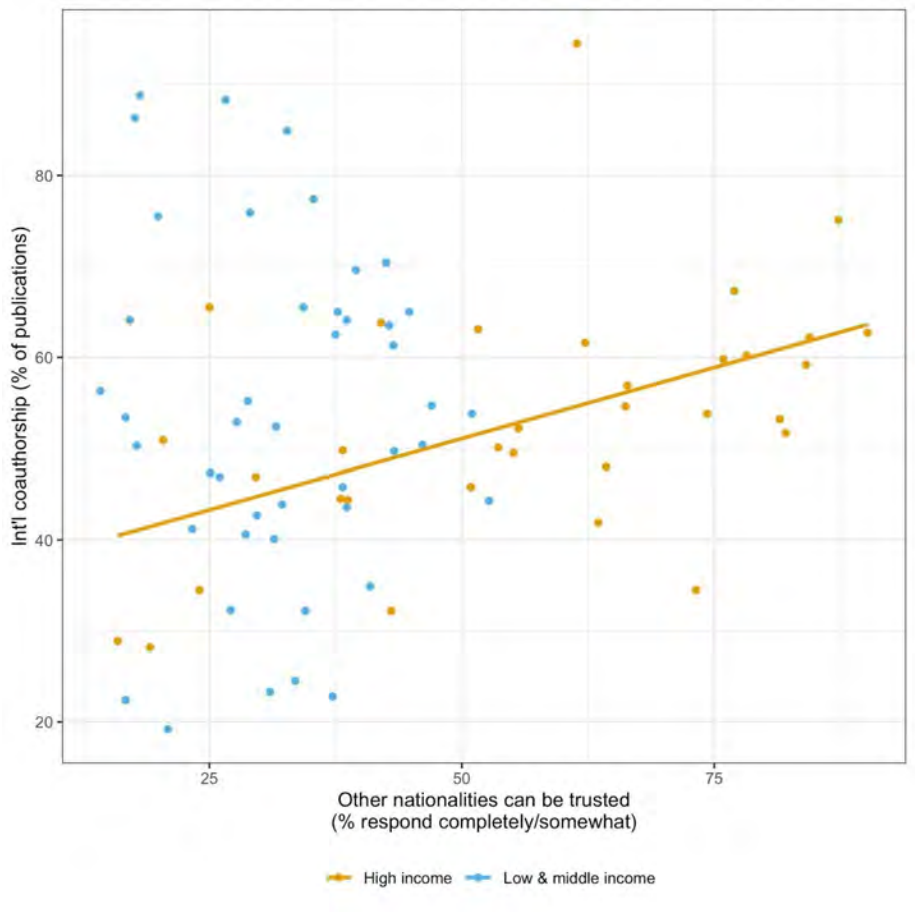
- Geopolitical instability
- Balancing openness and security
- Accessible infrastructure and resources
- Talent mobility
- Skills for navigating and leading collaborative research

https://www.weforum.org/stories/2021/06/ten-challenges-to-scientific-collaboration/



https://policylabs.frontiersin.org/content/landscape-of-international-scientific-collaboration

Fraction of international co-authorships by level of trust in other nationalities



https://www.worldvaluessurvey.org/wvs.jsp

https://policylabs.frontiersin.org/content/landscape-of-international-scientific-collaboration

Trust is the foundation on which collaboration happens

Three elements to support and build trust

- Peer mentoring
- Collaborative leadership
- Openness

Peer mentoring

The Global Young Academy experience

The Global Young Academy

- An academy of 200 early career researchers (meaning roughly within 10 years of PhD) representing all major regions around the world
- Selection criteria:
  - Research excellence
  - Commitment to service/outreach
- All disciplines welcome
- Members serve 5-year terms
- Alumni network includes individuals from 100+ countries

A forum for ECRs to develop enduring relationships

- Curating membership ensures commitment to research excellence and service to society
- Focus on ECRs leads to discussion of shared themes and tensions
- Tackling time-limited projects provides focus, urgency, and cooperation
- Disciplinary and geographic diversity ensures credibility in external engagements and cultivates cultural sensitivity

Peer mentoring in a global context

- Building connections among peers
- Practical advice on navigating career challenges
- Strategic advice on career progression (research opportunities, administration, leadership and decision-making)
- Inspiration globally to make an impact locally

Collective leadership

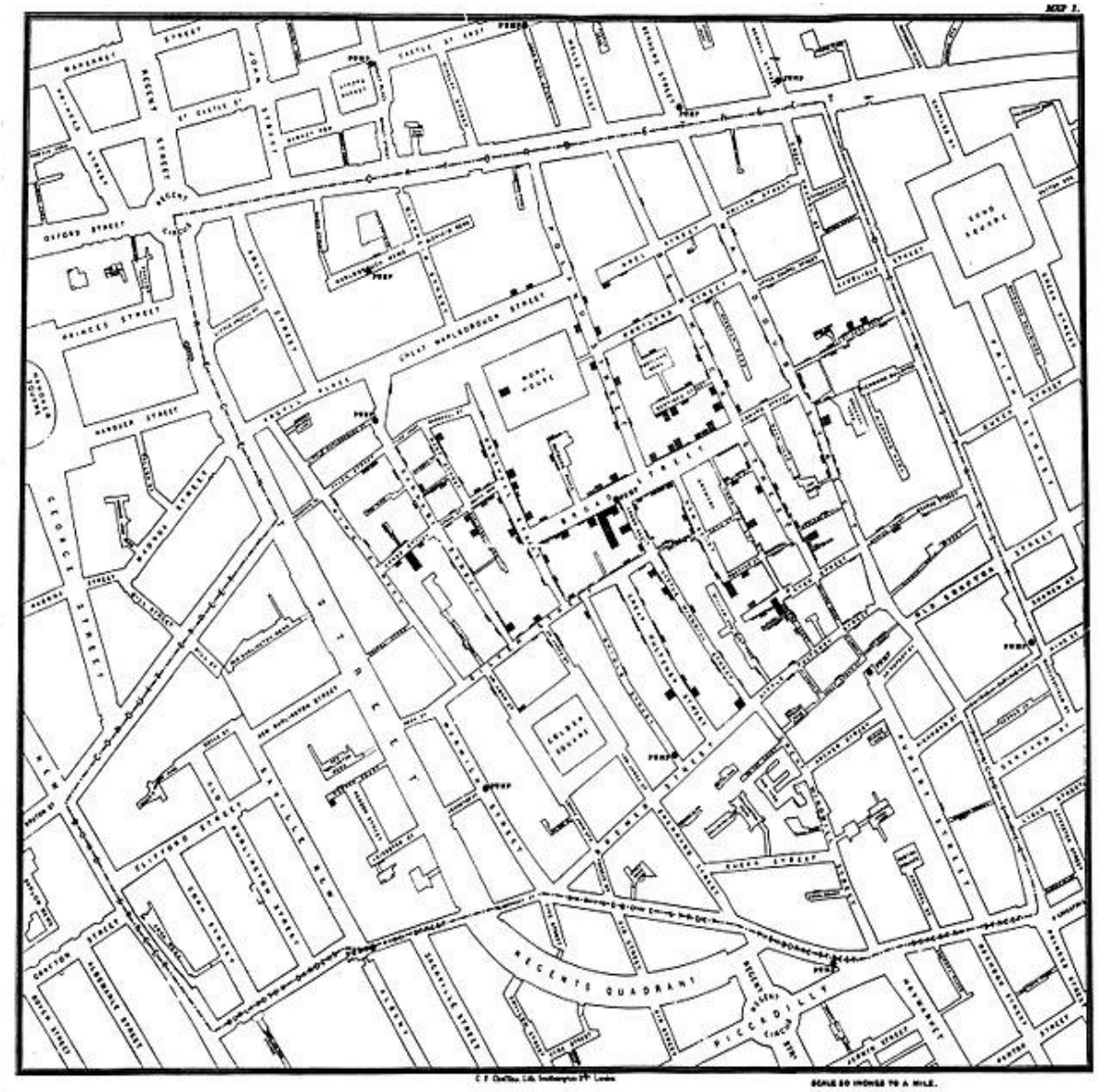
The Coronavirus in the Urban Built Environment (CUBE) experience

Collective leadership

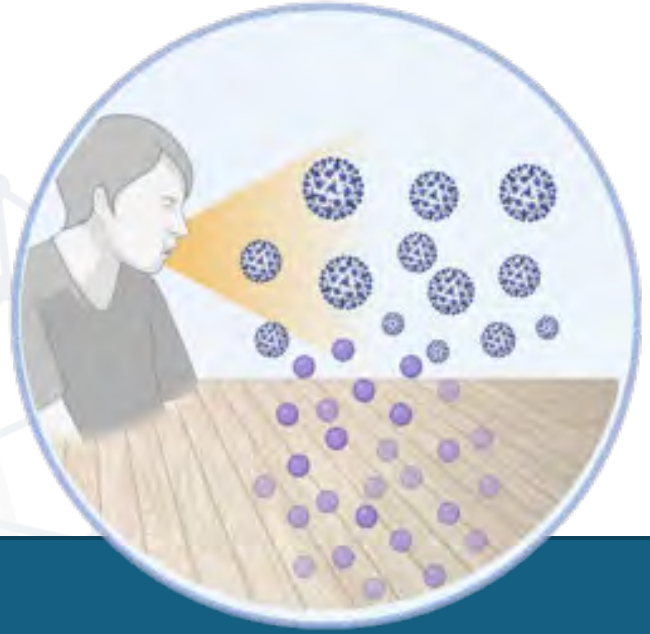
- Work *with* teams to address complex issues
- Recognizes that no individual has all the skills or energy necessary to address complex challenges
- Empowers different team members to take leadership roles when appropriate, and for limited time

How do we find what can’t be seen?

John Snow’s map of cholera cases in London, 1854



Coronavirus in the Urban Built Environment



Floors are sinks for the virus

Swabbing captures viral RNA

2023-03-15 (Image: Jean Delisle/CBC)

Probe samples using qPCR &/or metagenomic sequencing

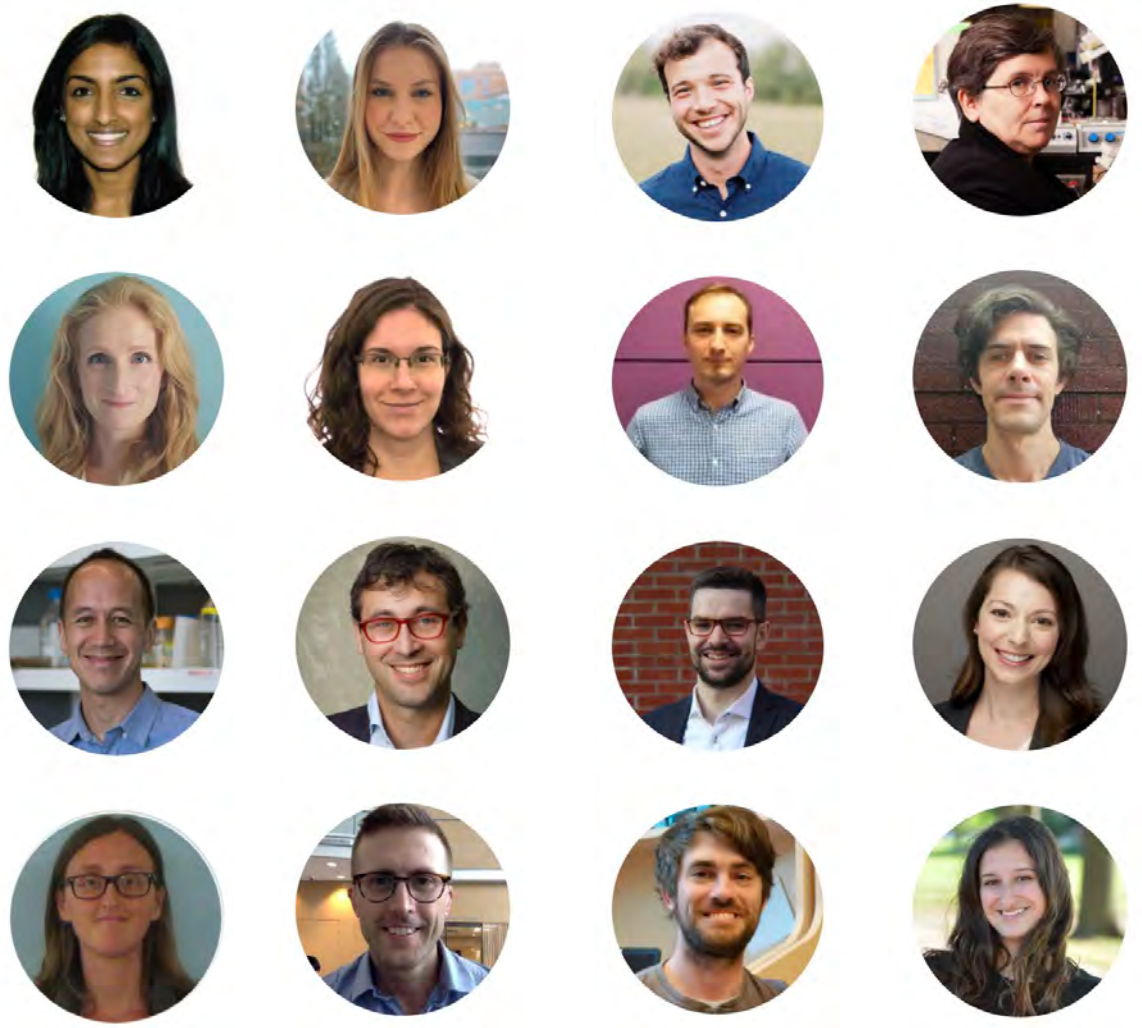
Cube

Surface swabs anticipate outbreaks in a long-term care home

NEJM Evid 2023;2(3)

What's worked

- Scrappy, entrepreneurial
- Purpose-driven, pragmatic research
- End-users & decision-makers integrated directly in research design
- Private sector support
- Responsive to emerging issues (e.g., H5N1)
- Networks in Canada and beyond



A ‘fly-wheel’ approach to collective leadership

- Mission-driven
- Members empowered to take leadership at different times
- Supported by cooperative decision-making
- Like a flywheel, this helps to preserve momentum, avoid burnout, and naturally curates the core research team

Training resources in collective leadership

Earth Leadership Program

Knowledge to Impact

https://www.earthleadership.org/

https://www.aslp.science/

Open to collaboration

The McGill Sustainability Park

Vision

Redefine what a university can be in the 21st century—an institution that both generates knowledge and actively co-creates solutions with society

Mission

We aim to be a global leader in sustainability-focused research, education, and engagement

Research

- Risk, resilience, and inequality in an age of uncertainty
- Public health in a changing climate
- Powering & constructing our collective future
- Feeding the future

Our innovation model

Research-to-action (ReACT) hubs are interdisciplinary clusters built to accelerate discovery-to-deployment.

Overcoming barriers to collaboration requires deliberate action to build trust

- Support global engagement and peer-to-peer networks such as the GYA
- Upskill ECRs to lead collaborative research that extends across disciplines and geographies
- Provide infrastructure and programming that is deliberately designed to be open and collaborative