Key messages

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Unprecedented mobilisation. Public research funders, private foundations and charities have set up an array of newly funded research initiatives worth billions of dollars in record time.

Science and technology offer the only exit strategy from COVID-19. The pandemic has underscored more than in other recent crises the importance of science and innovation to being both prepared and reactive to upcoming crises.

The pandemic has stretched research and innovation systems to their limits and exposed gaps and weak spots. There is an opportunity to reorient STI policies and direct science and innovation towards sustainable and inclusive futures.
The STI system response to Covid-19 has been decisive, rapid and significant
Research response to COVID-19

Evolution of COVID-19 research funding programmes and pledges

Funding for research and innovation has been supported by active government interventions around the world.

But there are risks of indiscriminate diversion of research efforts.

Source: Data gathered by OECD from public sources published by funders.
Research response to COVID-19

Trends in COVID-19 biomedical and life sciences research publications, 1 Jan to 30 Nov 2020

The COVID-19 pandemic has triggered an unprecedented mobilisation of the scientific community.

COVID-19 as an accelerator of trends already underway

76% of COVID-19 scientific publications are open access, c.f. diabetes (43%) and dementia (40%)

This, along with other changes, could accelerate the transition to a more open science in the longer run

COVID-19 as an accelerator of trends already underway

- Research and innovation activities have been severely disrupted by lockdowns and social distancing measures.

Current impact of COVID-19 on scientists' work

COVID-19 as an accelerator of trends already underway

Impact of COVID-19 on scientists’ work

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<th>Use of digital tools for research</th>
<th>Decrease</th>
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<td>Access to scientific information and data</td>
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<td>Funding for research</td>
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<td>Use of research materials and facilities</td>
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- Research and innovation activities have been severely disrupted by lockdowns and social distancing measures.
- Digital tools and open-data infrastructures have allowed scientists to continue to function outside their usual laboratory or field environments.

Business innovation response to COVID-19

The biopharmaceutical industry has launched hundreds of clinical trials targeting COVID-19 drugs and vaccines.

Registered COVID-19 vaccine studies by economy

Economies with two or more listed vaccine studies

Business innovation response to COVID-19

R&D expense and revenue growth in selected companies
Percentage change between April-September 2019 and April-September 2020

Heterogeneous impact with R&D performance in the digital sector thriving and activity in R&D-intensive manufacturing sectors falling (e.g. automotive, electronics)

Source: OECD calculations based on published quarterly business financial reports, December 2020.
A turning point for STI policy?

Digital technologies have mitigated effects of lockdowns  
STI has proven an essential element of the resiliency countries have shown in the crisis up until now  
There is unprecedented rapid development of vaccines

Could STI do even more to enhance societal and economic resilience?  
However, there are long-standing problems in STI systems that hinder their abilities to address challenges like COVID-19 and climate change

There are other challenges, too, notably the climate emergency, that require STI to embrace a sustainability agenda

Does COVID-19 offer a disruptive moment for these problems to be addressed more aggressively by STI policy?
Looking forwards, to tackle the challenges of sustainability, inclusivity and resiliency, governments will need to reorient their STI policies.
The need to reorient STI policies

The pandemic is an opportunity to reorient STI policies and trajectories

Main elements of STI policy reform to tackle the challenges of sustainability, inclusivity and resiliency

- Acquire dynamic capabilities in governments
- Implement global solutions for global problems
- Rebalance the STI policy mix to target societal challenges
- Promote transdisciplinarity to deal with complex problems
- Reform PhD training to support career path diversity
Moving towards a more targeted policy mix

Tax incentives have displaced direct funding over the last two decades.

A new ambitious policy agenda will need to reverse this.

Govt spending on R&D will need to be defended.

Shift in business R&D support policy mix, 2000-19

The US policy mix is less dependent on tax incentives.

International science collaboration has been critical

A lot of international scientific cooperation on COVID-19 has been initiated by researchers themselves, and has built on existing ties.

Science depends on the global knowledge commons for progress.

The ascendancy of China

The prominence of China in these links is hardly surprising. China has become the world’s second-largest R&D performer – 80% of the expenditure of the United States in 2018.

Source: OECD MSTI 2020/1, Aug. 2020
China and the US have close scientific ties

Research links between China and OECD countries have grown strongly in recent years, and this is reflected in patterns of COVID-19 co-publication.

But there are concerns about a lack of reciprocity in these relationships that threaten their future.

Acting globally to solve global problems is critical

ACT-Accelerator is driving unprecedented collaboration

- Just as the pandemic is a global problem, it requires global solutions involving international STI co-operation and collaboration.

- The impressive speed on vaccines has built on nascent global co-operation to develop new technology platforms to tackle emerging disease . . . and years of basic research funding.

New approaches to technology governance: anticipatory, participatory and directed

OECD Recommendations on AI and Neurotechnology

- Targeted efforts to shift technology governance more upstream
- Making it more anticipatory, and engaging stakeholders at an earlier stage so as to better maximize the positive attributes for societal goals and minimise the negatives

GPAI / THE GLOBAL PARTNERSHIP ON ARTIFICIAL INTELLIGENCE
Government support to STI will need to be more directed to deal with the sorts of challenges we face: furthermore, the science system needs to support more high risk / high reward research to foster breakthroughs.

Global co-ordination will need ramping up to tackle these challenges: the US is well-placed to adopt leadership roles in establishing the necessary international arrangements, such as collaborative technology platforms.

Relations with China: China cannot be excluded from these international arrangements, but collaboration should ensure core values, such as openness in science, academic freedom, and research ethics are respected.
Learn more in the ‘dual format’ OECD STI Outlook

Book launch today  Website online: oe.cd/sti-outlook
Stay informed on countries’ STI Policies to tackle COVID-19

Get the latest information on STI policy responses to the crisis across +40 countries and the EU, with timelines and other interactive charts.

Featuring information on 700 STI policy initiatives targeting scientific advice and communication, collaboration mechanisms, new funding initiatives, impacts on the STI system, etc.

https://stip.oecd.org/covid/
THANK YOU!

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