# OECD STI OUTLOOK 2021

## TIMES OF CRISIS AND OPPORTUNITY

STI Outlook launch
12 January 2021

# Key messages

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# OECD STI Outlook – the narrative

**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

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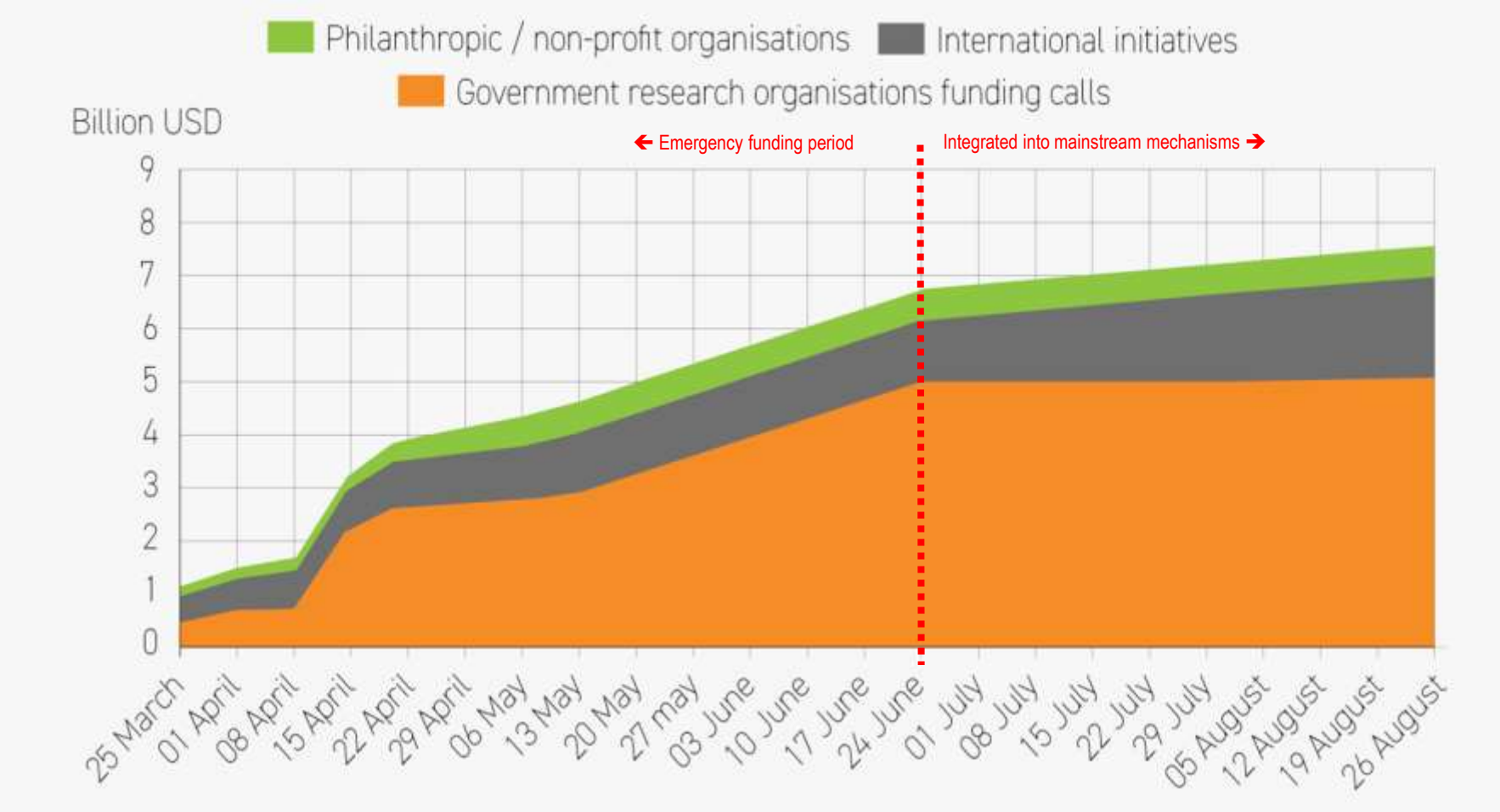
# Research response to COVID-19

## 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

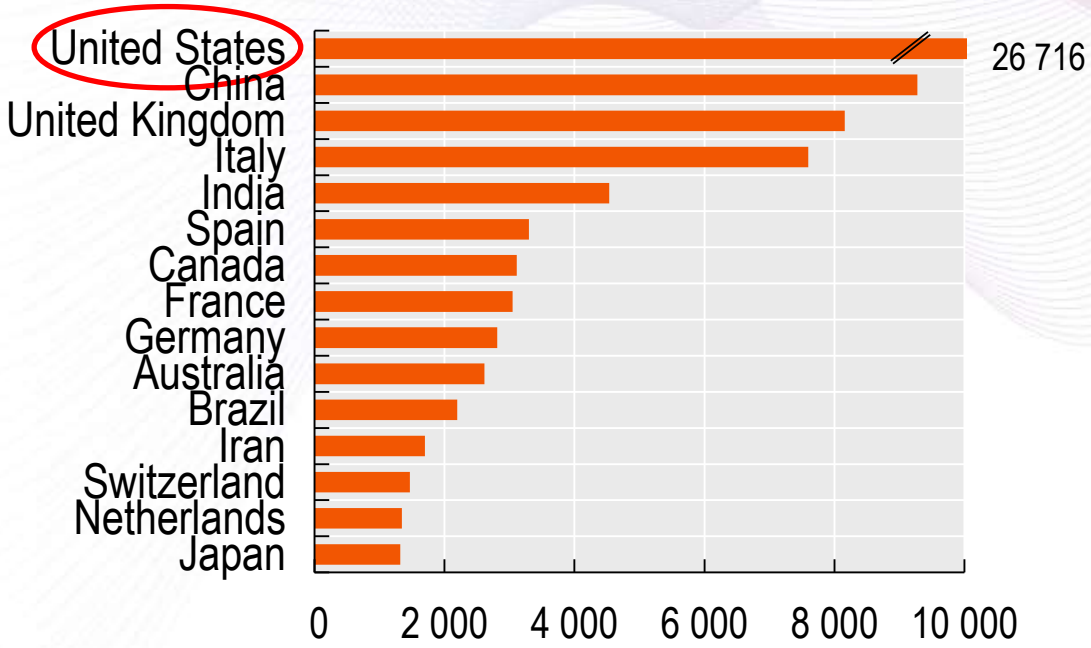


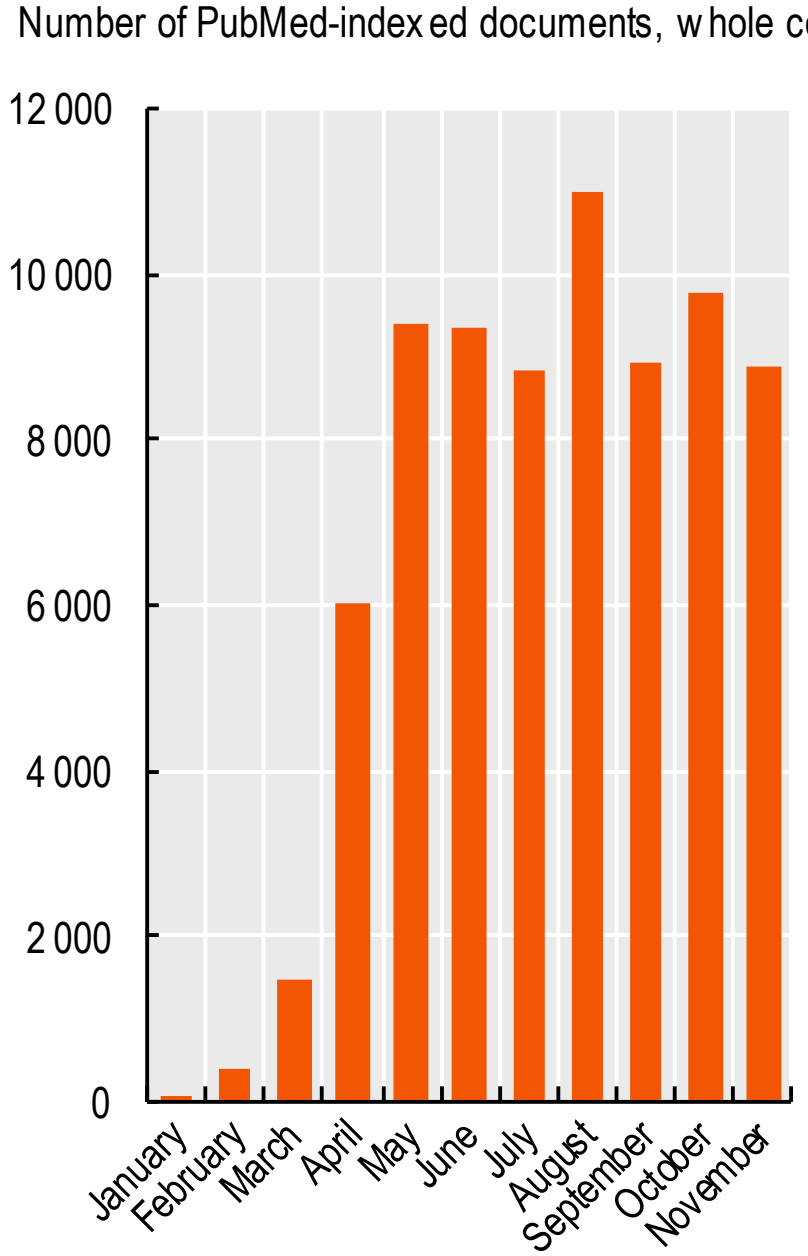

*Source*: Data gathered by OECD from public sources published by funders

# 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



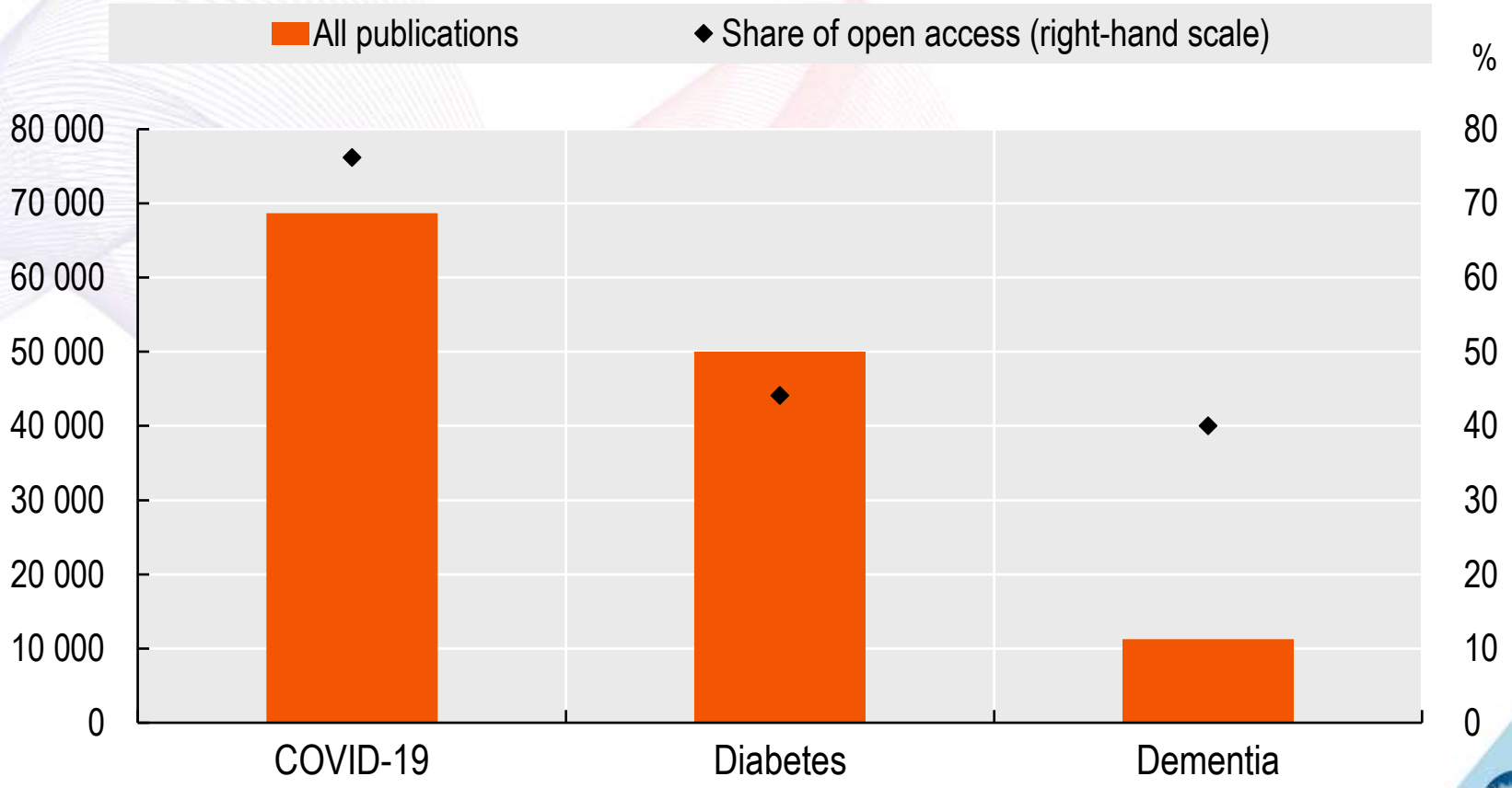

Source: OECD calculations based on US National Institutes of Health PubMed data, https://pubmed.ncbi.nlm.nih.gov/, (accessed 30 November, 2020).

# 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

## Open access of COVID-19, Diabetes and Dementia publications, January-October 2020

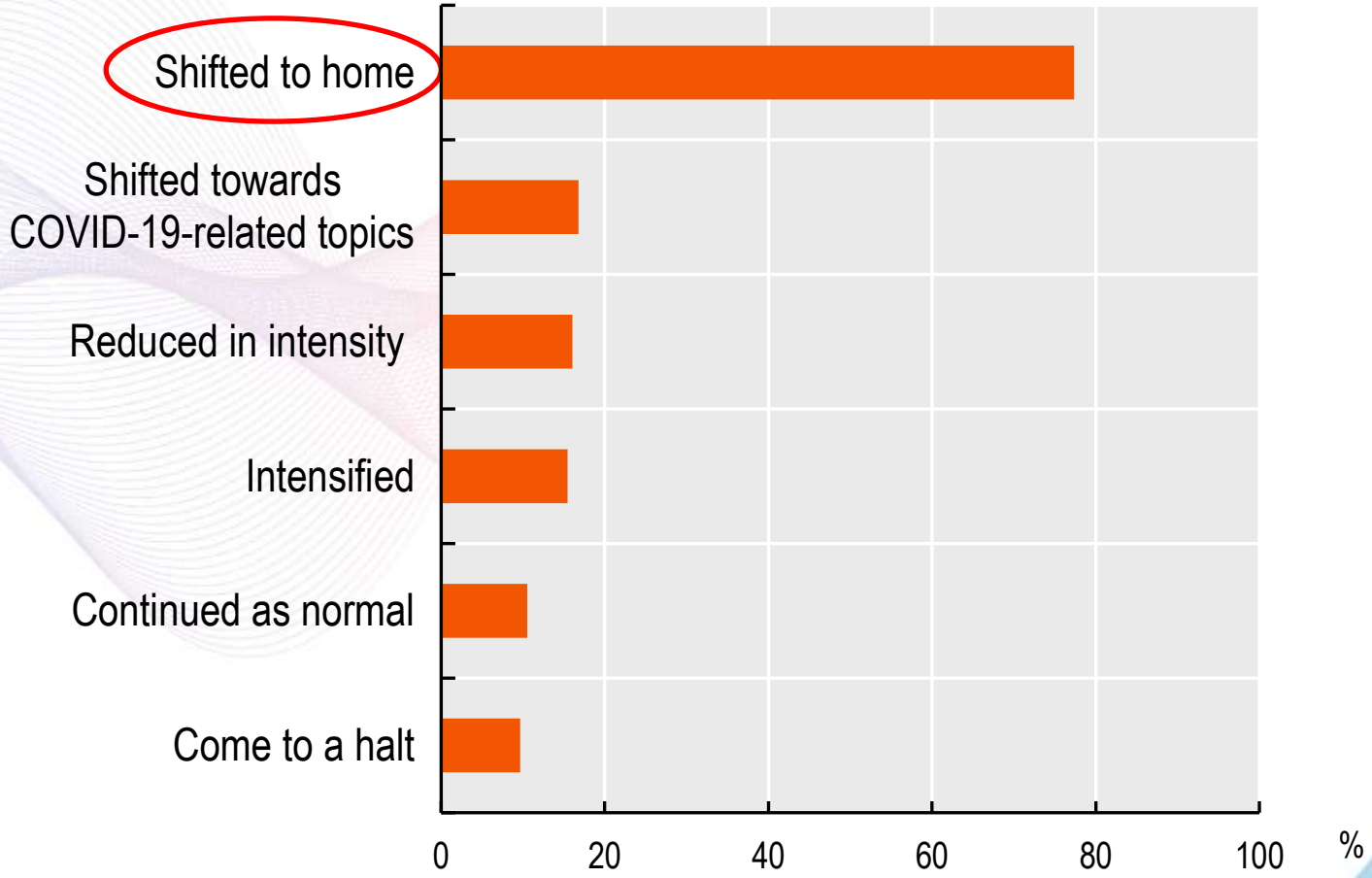



Source: OECD calculations based on US National Institutes of Health PubMed data, https://pubmed.ncbi.nlm.nih.gov/, (accessed 30 October, 2020).

# 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



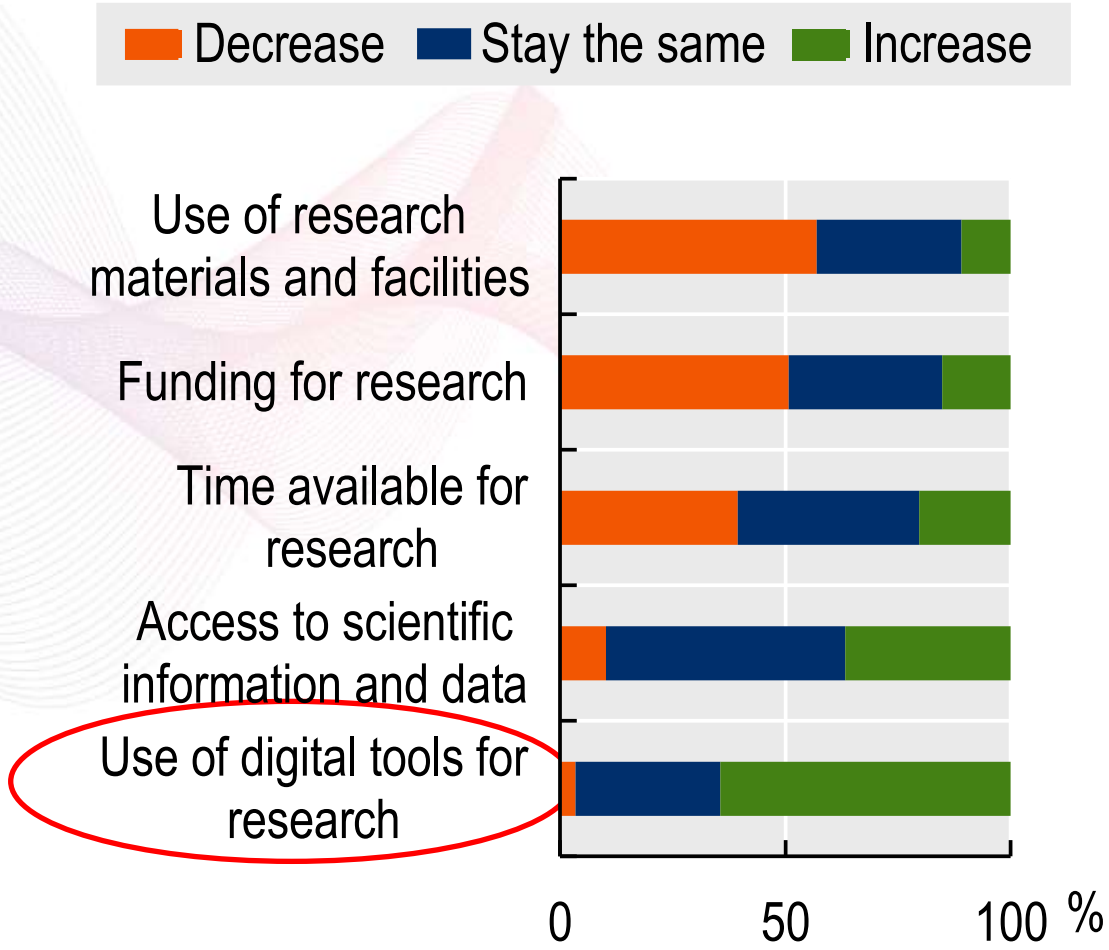

OECD Science Flash Survey 2020, https://oecdsciencesurveys.github.io/2020flashsciencecovid/, (accessed on 12 October 2020)

# COVID-19 as an accelerator of trends already underway

- 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

## Impact of COVID-19 on scientists' work

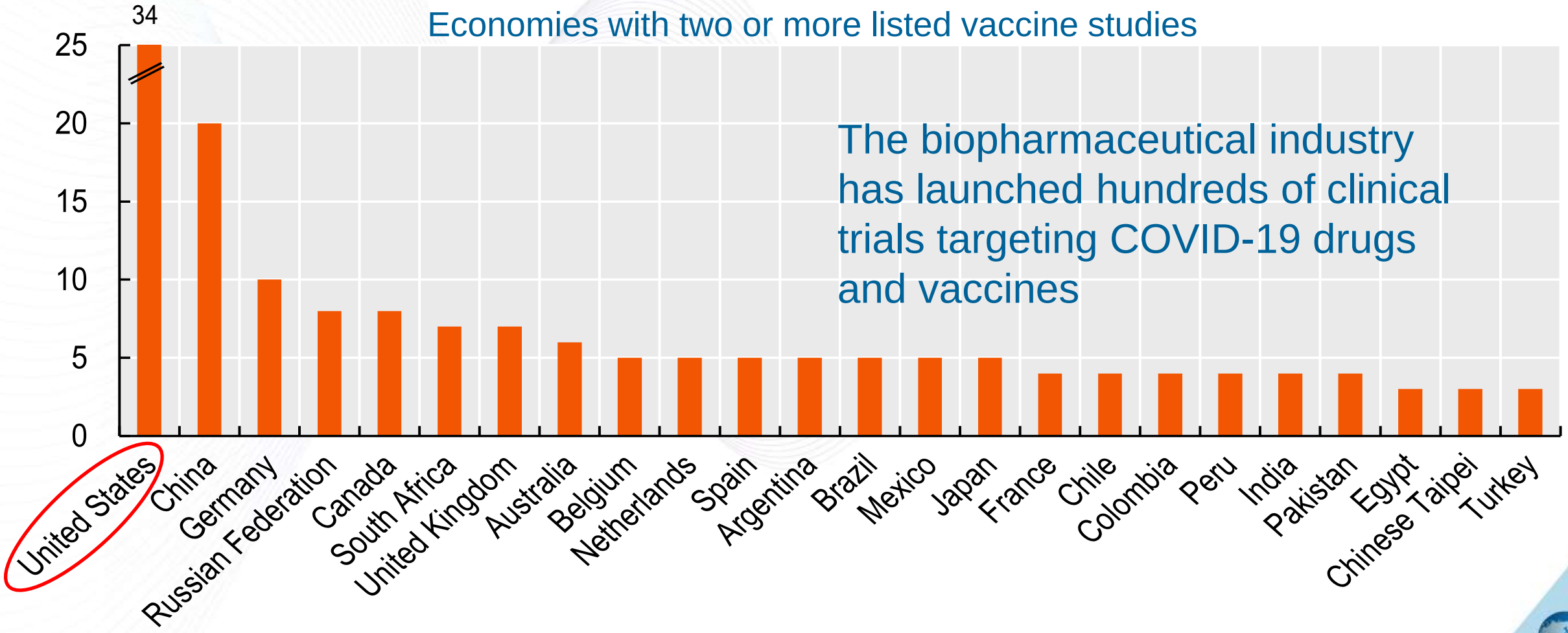



OECD Science Flash Survey 2020, https://oecdsciencesurveys.github.io/2020flashsciencecovid/, (accessed on 12 October 2020)

# Business innovation response to COVID-19

## Registered COVID-19 vaccine studies by economy

Economies with two or more listed vaccine studies

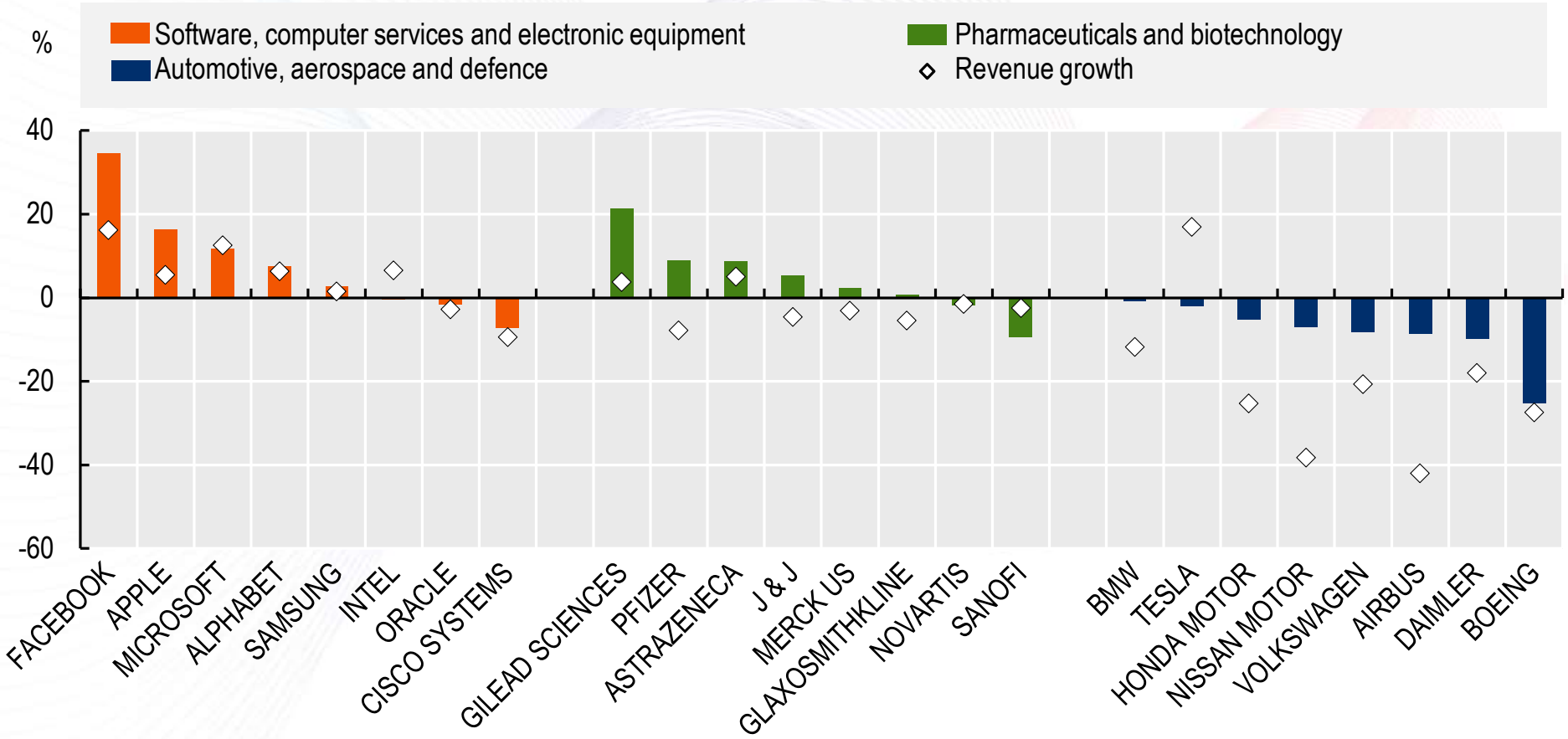



*Source:* United States National Institutes of Health, ClinicalTrials.gov, (accessed 8 December, 2020).

# 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

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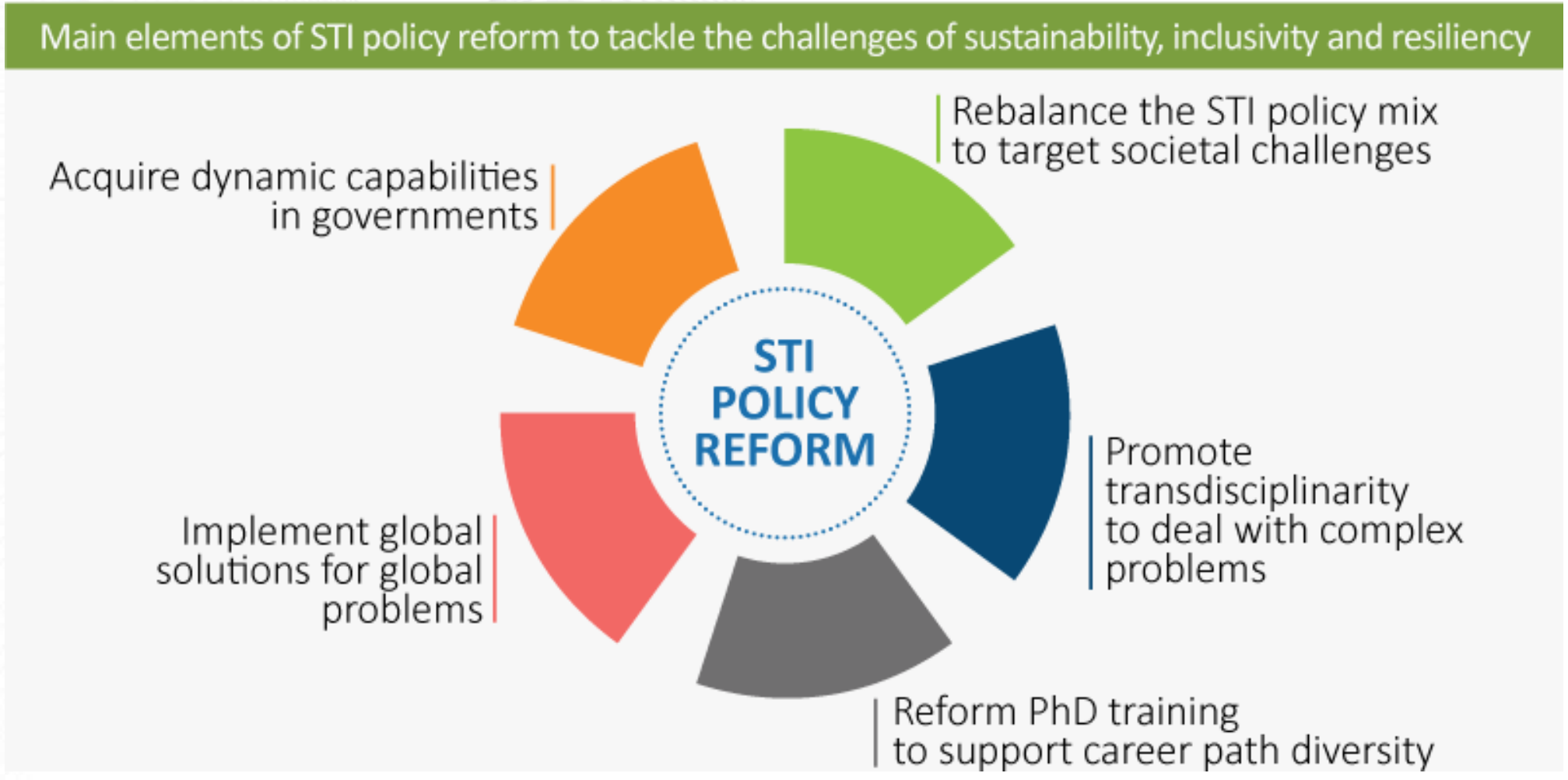
# The need to reorient STI policies

## The pandemic is an opportunity to reorient STI policies and trajectories



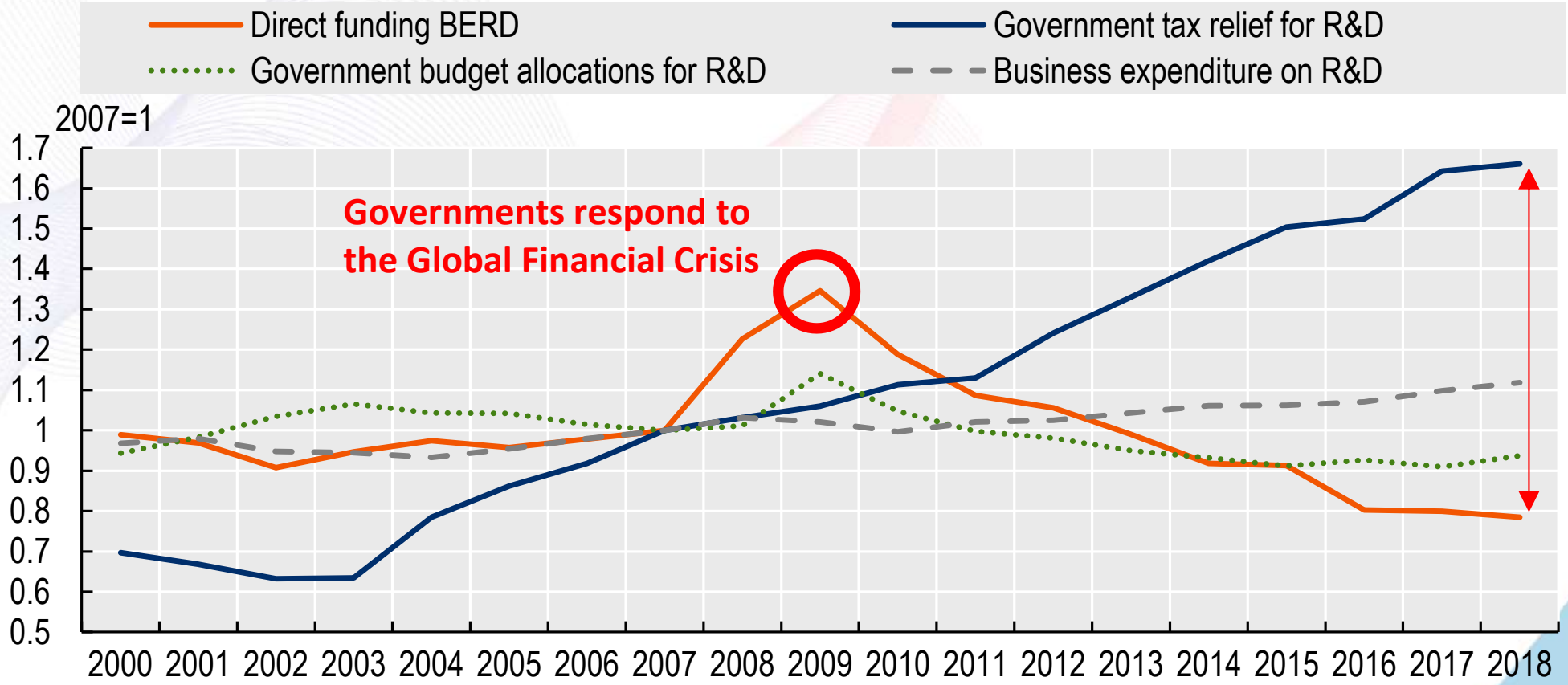
# Moving towards a more targeted policy mix

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

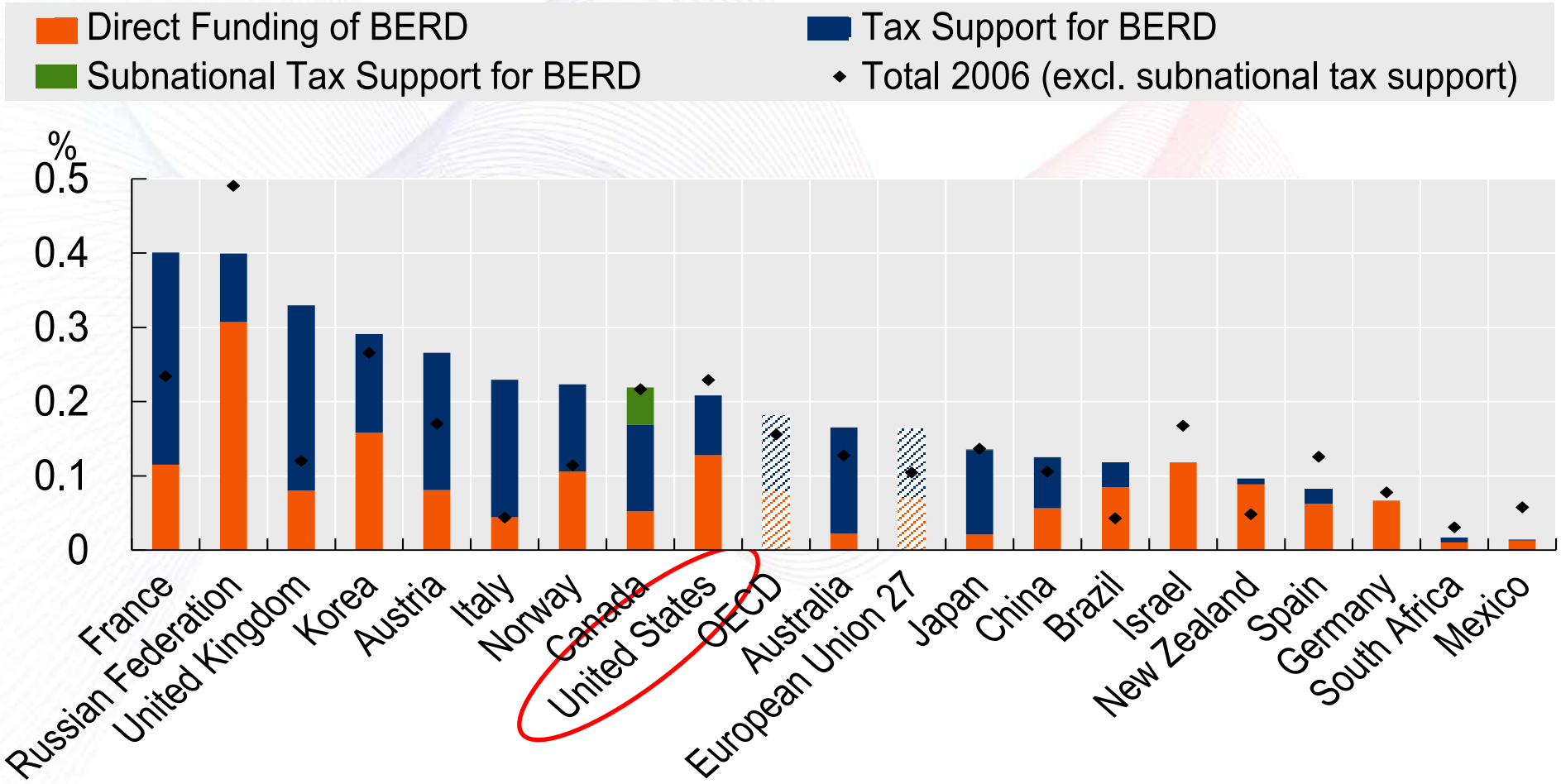
## Shift in business R&D support policy mix, 2000-19




*Source*: *OECD R&D Tax Incentives Database*, August 2020, http://oe.cd/rdtax

# The US policy mix is less dependent on tax incentives

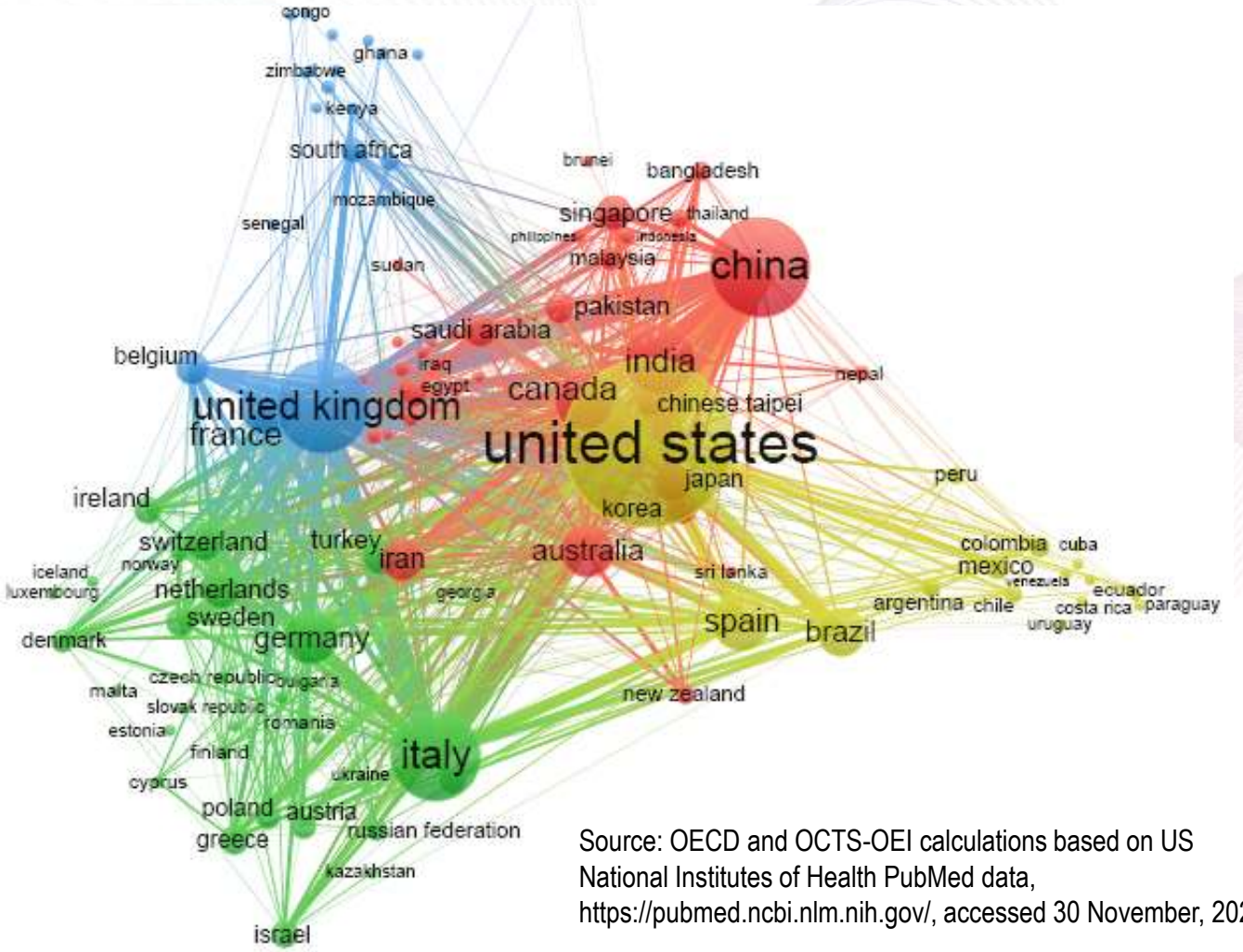
## Direct government funding and government tax support for business R&D (BERD) 2018 and 2006




*Source*: *OECD R&D Tax Incentives Database, http://oe.cd/rdtax, December 2020.*

# International science collaboration has been critical

## International scientific collaboration on COVID-19




Source: OECD and OCTS-OEI calculations based on US National Institutes of Health PubMed data, https://pubmed.ncbi.nlm.nih.gov/, accessed 30 November, 2020.

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

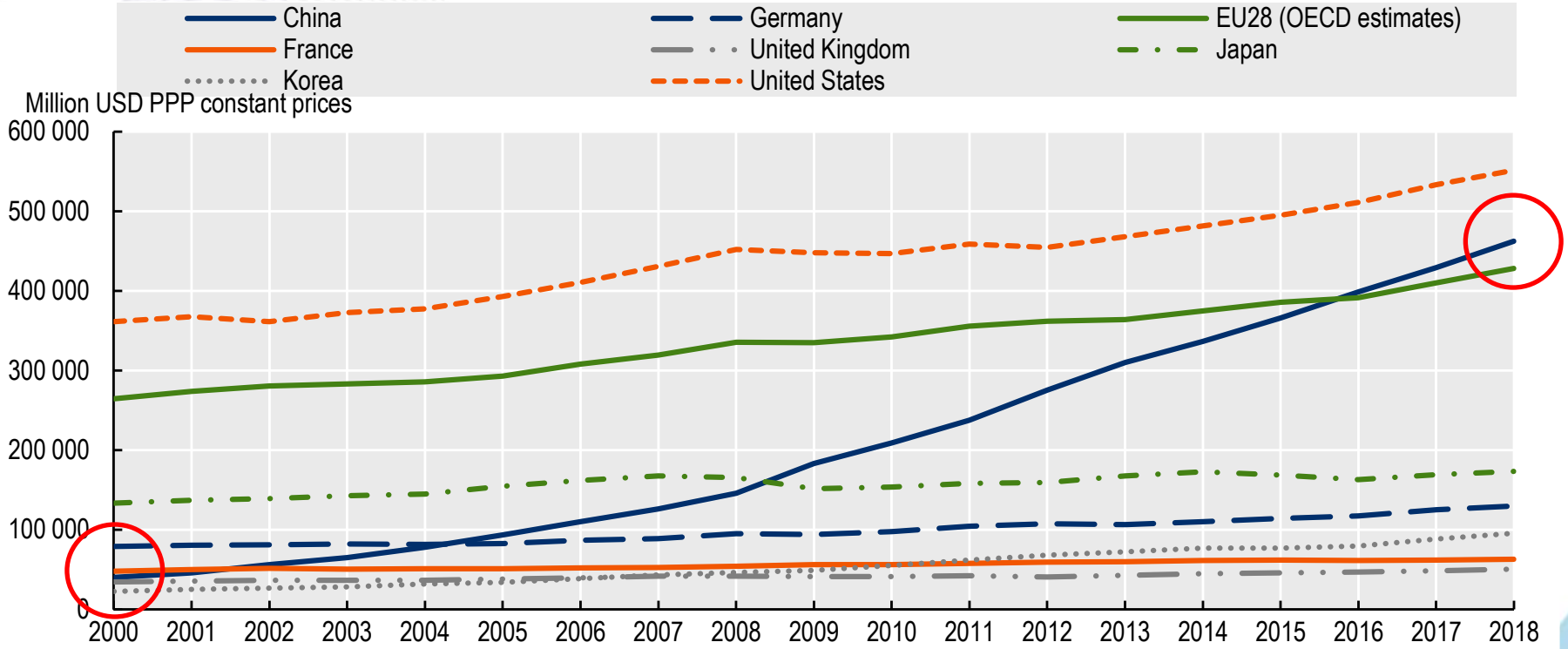
Science depends on the global knowledge commons for progress

# The ascendency of China

## Gross Domestic Expenditure on R&D (GERD), 2000-18

The prominence of China in these links is hardly surprising

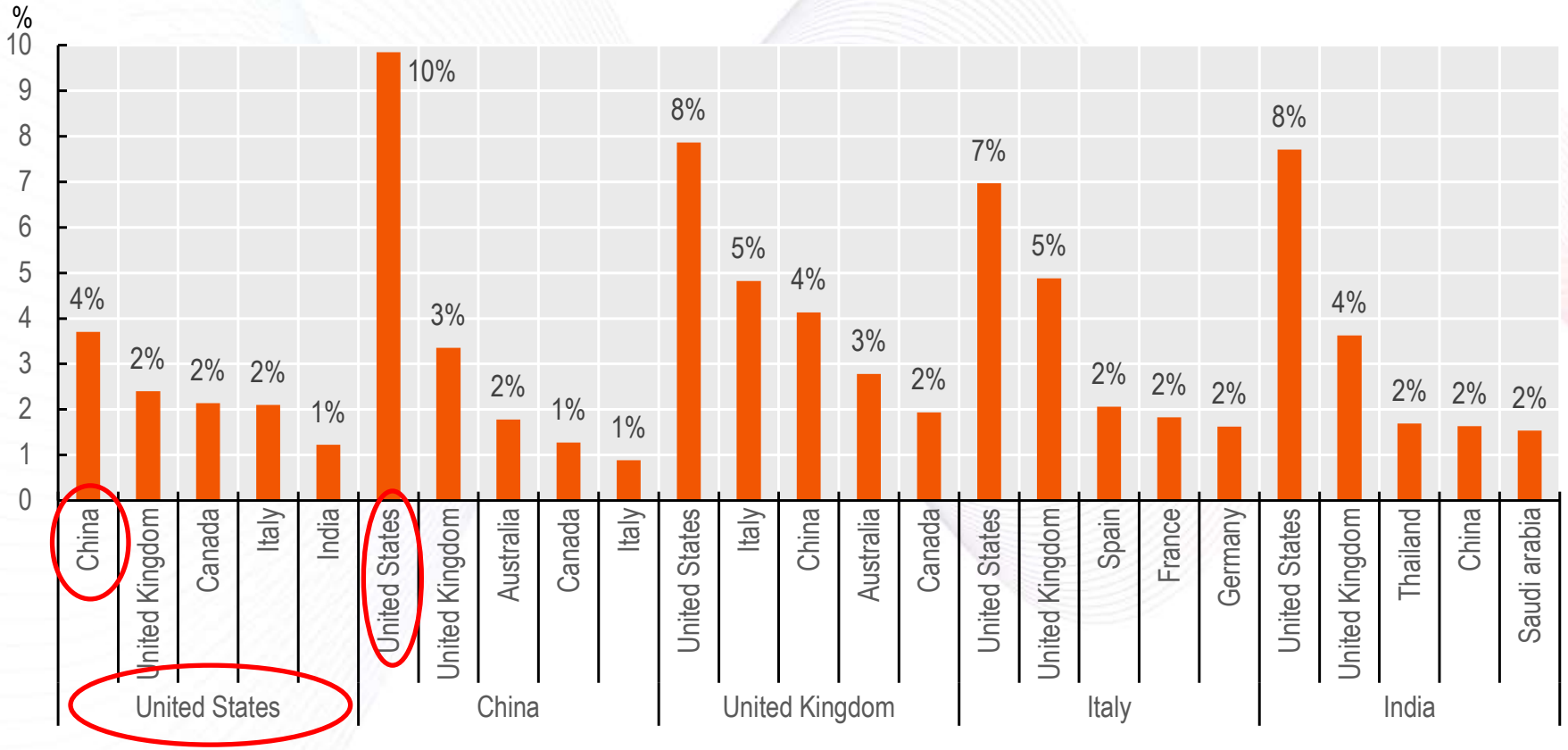
China has become the world's second-largest R&D performer – 80% of the expenditure of the United States in 2018




Source: OECD MSTI 2020/1, Aug. 2020

# China and the US have close scientific ties

## International scientific collaboration on COVID-19




Source: OECD and OCTS-OEI calculations based on US National Institutes of Health PubMed data, https://pubmed.ncbi.nlm.nih.gov/, accessed 30 November, 2020.

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

Source: WHO (2020), ACT-Accelerator: Status Report & Plan, September 2020 – December 2021

# 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

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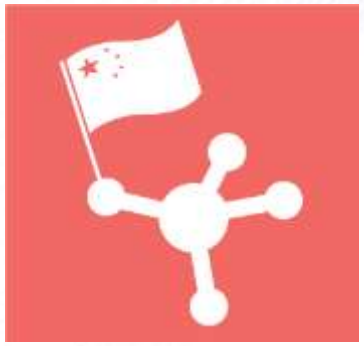
# OECD STI Outlook – take-away messages for the United States

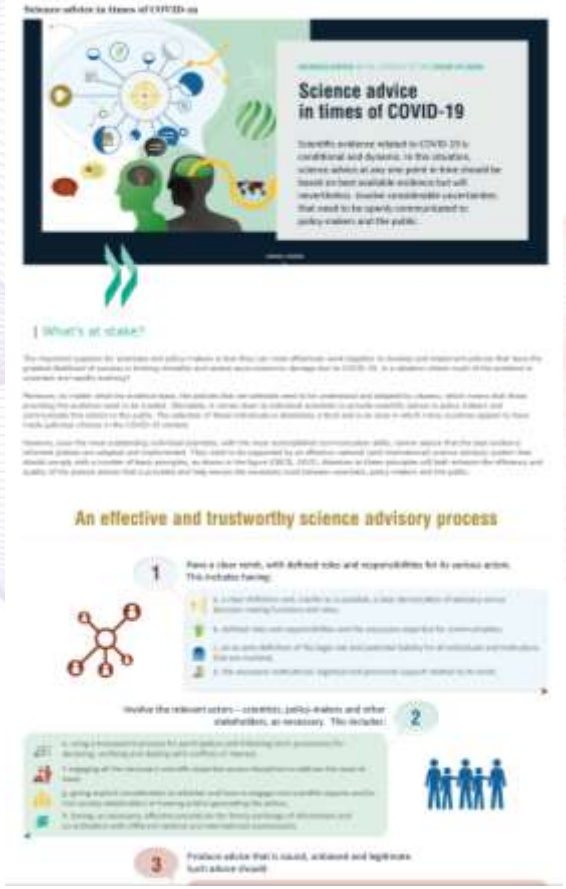
**Government support to STI will need to be more directed to deal with the sorts of challenges we face**: furthermore, the science system needs to support more high risk / high reward research to foster breakthroughs

**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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