



President-elect Joe Biden has a very different approach from that of his electoral opponent.

Memo for President Biden: Five steps to getting more from science

Roger Pielke Jr & Neal Lane

Going back to normal is not enough. A revamp is required.

As things look now, the US presidency of Donald Trump will soon be in the rear-view mirror, but the damage his administration leaves behind will require a sustained effort to repair. That's especially true when it comes to restoring competency and trust in federal

research agencies. President-elect Joe Biden needs to do this as soon as possible, not least to quell a pandemic that is setting records for the numbers of new cases and is on track to kill more Americans than died in the Second World War. The country cannot continue to bear the ad hoc, ineffective and incoherent pandemic response it has endured under Trump.

The list of needed actions is long, but here we highlight five that the Biden administration should take swiftly. We call not for a return to business as usual but for

fundamental, sometimes counter-intuitive changes that will strengthen the use of science in US policy and by the research community more broadly.

Let an oft-overlooked White House office lead the pandemic response

Trump's coronavirus task force, which ostensibly guided the administration's response to the pandemic, had little authority and no accountability, had to fight for attention against other priorities, and was deliberately politicized. The task force usurped the leading role of the Department of Health and Human Services, and sidelined its Centers for Disease Control and Prevention, damaging public trust in both.

A better, albeit less-obvious, option to lead the pandemic response under Biden is the White House Office of Science and Technology Policy (OSTP, which one of us, N.L., led from 1998 to 2001). It was established in 1976 to advise the president and coordinate federal science agencies. Although the OSTP has predominantly focused on deciding priorities for research funding, its history and mandate make it ideally poised to coordinate a national effort for responding to COVID-19.

In February, as the pandemic was just beginning to spread in the United States, the Government Accountability Office warned that the nation's biodefence strategy needed "to move away from traditional mission stovepipes toward a strategic enterprise-wide approach". The OSTP has the perspective needed to work across agencies, and it has coordinated policy before. Former president Ronald Reagan relied on it to advance his 'Star Wars' ballistic-missile defence programme.

What's more, the OSTP would offer a fresh start to the pandemic response. Under Trump, it had little visible role and so, unlike the federal public-health agencies, has been less politicized.

Finally, the OSTP sits in the White House but is also accountable to Congress, with a director confirmed by the Senate. That keeps it both close to the president and subject to congressional oversight, unlike Trump's coronavirus task force. Leadership will require working across branches of government, and having the OSTP in charge would boost legitimacy, because the Democrat-led office will be working with a Republican-led Senate. At the same time, the head of the OSTP – the White House science adviser – should also be elevated to the president's cabinet. This guarantees a seat at the table when the most important, consequential decisions are made. It will also signify the importance of the role to federal agencies, to Congress and to the public.

Make advisory processes more independent

A tenet of effective advisory bodies is that advisers advise and decision makers decide.

KEVIN LAMARQUE/REUTERS

Advice might take the form of narrow technical guidance on scientific matters (does a particular drug improve COVID-19 health outcomes?), presentation of policy alternatives (what are the risk-reduction options for reopening schools?), or recommendation of a specific action (should masks be mandatory indoors?). Under Trump, scientific advice was typically ignored or, worse, manipulated for political expediency. That is easier to do when responses are managed by ad hoc groups. For example, radiologist Scott Atlas was selected as Trump's top pandemic adviser to counter government staff scientists and support the political agenda of the president.

The advisory mechanisms available to draw on are broad and deep. The US government lists more than 1,000 bodies currently active under the Federal Advisory Committee Act. Biden and the OSTP must ensure that advisory committees consist of independent experts selected for competency, that their role is clear, and that their advice reaches decision makers in the field – from public health to environmental protection.

The White House will also need to reject Trump-era policies that keep the government from drawing on competent expertise. First in line should be reversal of an executive order signed last month that removed civil-service protections from positions usually filled by career employees, making them easier to fire for political reasons. Advisory committees, such as those leading the US National Climate Assessment, should comprise independent experts, selected by bipartisan panels (as is typically done for committees linked to politicized issues), and not political appointees. And political appointees should never alter or edit science advisory-committee reports or recommendations.

The main criticism of such reforms might be that they would empower independent experts over administration officials. Indeed – we see that as a feature, not a flaw. Also, having independent advice doesn't mean decision makers will always heed it; the administration of former president Barack Obama decided, contrary to recommendations of its expert advisers, to limit distribution of the morning-after pill in 2011; it similarly rejected expert advice in 2016 to strengthen ozone regulations. Still, as Biden has said, decision makers have an obligation to "listen to the scientists".

Expedite scientific-integrity legislation

The Obama administration instigated an effort to implement scientific-integrity policies across federal agencies; some 24 agencies developed relevant administrative policies in response.

But several subsequent reviews, including one by the Government Accountability Office,

found these scientific-integrity policies to be unevenly interpreted and applied. Some agencies, such as the Department of Defense, were not included under the mandate. Others, including the National Institutes of Health and the Department of Labor, did not develop policies. Agencies that did develop policies defined 'scientific integrity' in different ways, and created conflicting guidelines for topics such as media relations and how to handle disparate scientific perspectives. And the Trump administration rode roughshod over these rules anyway, for instance by barring a Department of State analyst from including

“The White House will need to reject Trump-era policies that keep the government from drawing on competent expertise.”

information about climate change in written testimony to a congressional committee.

Harmonized legislation that allows congressional oversight would be more difficult to ignore or evade. Several proposals exist that would promote scientific integrity, protect agency officials and strengthen the ability of Congress to keep the executive branch in check. Presidents rarely advocate restricting their own power, but Biden should. One relevant bill was introduced in the House of Representatives in 2019 and has more than 200 co-sponsors.

Give public universities tough love and lots of support

The US public-university system has suffered deep budget cuts during the pandemic, with no relief in sight. And state governments had been cutting support in the decades before that. On average, according to the American Academy of Arts and Sciences, states cut funding per student by 30% between 2000 and 2014 – leading to tuition and fee hikes, a greater reliance on out-of-state tuition to replace those state funds, and drastically increased student debt. Some students are particularly disadvantaged: a recent report from the Education Trust gave failing grades to more than 75% of the nation's top 101 universities for their accessibility to Black students, with about 50% receiving failing grades for accessibility to Latino students (see go.nature.com/2i7pidk).

The federal government should help public universities with long-term financial sustainability, and perhaps even provide temporary recovery funding. Strings attached should include plans to boost diversity among students, faculty members and researchers.

Critics might argue that such issues are not the concern of the federal government.

However, the data indicate that these issues are a systemic, national concern. There is ample precedent for a federal role in higher-education policy, dating back to the 1965 Higher Education Act.

Refocus science funding

In spite of the Trump administration's efforts to slash investment, Congress ensured that federal funding of research and development increased by more than 20% between 2017 and 2020. Still, the United States ranks tenth among member nations of the Organisation for Economic Co-operation and Development in national investment (public and private, as a percentage of gross domestic product) in research and development, and the federal government's share of that has fallen steadily over recent decades.

Policy proposals from Biden's team, and several bipartisan bills in Congress, suggest that federal research and development funding will grow substantially. That growth must come with shifts in priorities. It should no longer be based on incremental changes to legacy budgets, as presidents often put forward. Instead, it must give higher priority to achieving national policy goals, beyond fundamental scientific knowledge.

For instance, achieving net-zero carbon dioxide emissions from electricity generation will require a new era of federal-industry partnerships supporting sustained energy-technology innovation. Other priorities should include research and development to help Americans recover from the pandemic, the economic catastrophe, the 'infodemic' and the ravages of systemic inequality.

The academic research community conventionally emphasizes basic research over science directed at solving societal challenges, because the former occurs mainly in academia and the latter in federal laboratories. To gain researchers' support for 'mission science', the Biden administration will need to assure them of its continuing support for basic research.

The challenges the Biden administration faces are daunting. Yet they create opportunities to make 'build back better' a reality, not just a bumper sticker.

The authors

Roger Pielke Jr is a professor of environmental studies at the University of Colorado Boulder, USA. His books include *The Honest Broker: Making Sense of Science in Policy and Politics*.

Neal Lane is a senior fellow in science and technology policy at Rice University's Baker Institute in Houston, Texas, and former director of the White House Office of Science and Technology Policy and the National Science Foundation.

e-mails: rpelkejr@gmail.com; neal@rice.edu