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#### Sage-grouse rider failed on infrastructure but Republicans are still trying to push it. Avoiding sage-grouse rider passage is key to conservation efforts through the threat of an ESA lisiting.

McGlashen 7/22 “Congress Is Set to Remove a Longstanding Barrier to Listing Greater Sage-Grouse Under the Endangered Species Act” Andy McGlashen [Associate Editor, Audubon Magazine] July 22, 2021 <https://www.audubon.org/news/congress-set-remove-longstanding-barrier-listing-greater-sage-grouse-under> SM

Some environmentalists thought that federal wildlife officials made a serious mistake when they decided, in 2015, not to list the Greater Sage-Grouse as threatened or endangered under the Endangered Species Act (ESA). Given all the habitat the species has lost in its 11-state range since then, plenty of advocates still think the feds should list it.

In reality, however, designating the bird as threatened or endangered wasn’t an option back then, and it still isn’t today. In 2014, Republicans in Congress prohibited the U.S. Fish and Wildlife Service (FWS) from listing sage-grouse under the ESA by tucking a snippet of text to that effect into a sprawling bill to fund the federal government. Supporters of the budget rider, as such provisions are known, described it as a way to respect state and local conservation efforts. Despite environmental groups’ repeated efforts to pry it out of subsequent budgets, the rider has remained stubbornly in place ever since.

But maybe not for long. The rider was nowhere to be found in a bill the House Committee on Appropriations passed earlier this month to fund Department of the Interior programs and agencies in 2022, including FWS. That could change before Congress passes the bill, but for now sage-grouse advocates are optimistic.

“There's really no reason this rider should reappear,” says Steve Holmer, vice president of policy at the American Bird Conservancy, one of 80 green groups that urged congressional leaders to ditch the no-listing language in a May letter. “As far as we’re concerned, it’s dead unless someone goes out of their way to put it back in.”

A handful of House Republicans moved on Wednesday to do just that. Reps. Dan Newhouse of Washington, Doug LaMalfa of California, and Mike Simpson of Idaho offered an amendment to add the rider back into the bill. Rep. Lauren Boebert of Colorado proposed a similar measure. “Congressman Simpson strongly believes the language he has added to the Interior appropriations bill for the last seven years is still necessary to prevent the sage grouse from being listed,” said Nikki Wallace, Simpson’s communications director, in an email to Audubon. “Listing the species will do nothing to increase their numbers, but it will have a major negative impact on our ranchers.”

Those amendments stand very little chance of surviving a vote from the full, Democrat-held House, expected next week. Advocates are also urging the Senate, where Democrats hold the slimmest possible majority, to squash the rider. Lawmakers should get out of the way and let FWS do its job based on the best available science, not politics, they say.

The latest science says that Greater Sage-Grouse, and the 350 other species that depend on sagebrush habitat, are in an increasingly tight spot.

The latest science says that Greater Sage-Grouse, and the 350 other species that depend on sagebrush habitat, are in an increasingly tight spot. A federal study in March revealed that sage-grouse populations have plummeted by 80 percent since 1965, with half of that decline occurring since 2002. Wildfires, oil and gas activity, and other forms of development are still taking big bites out of the sagebrush ecosystem.

“Given the alarming declines in sage-grouse populations and mounting threats to the species and its habitat, the federal government, states and partners should have all options available to conserve and recover grouse—and to prevent its extinction,” said Mark Salvo, program director at the Oregon Natural Desert Association, in an email. “This Congress has an opportunity to ensure federal agencies have the authority, direction and resources to support this goal.”

While scrapping the rider would clear the way for an ESA listing, some conservationists view it primarily as a way to motivate the various stakeholders who live and work in sage-grouse country to conserve and restore more habitat. The threat of a listing, and the new restrictions it would put on a range of land uses, spurred energy companies, ranchers, states, and others to reach a landmark agreement in which they committed to conservation measures in lieu of a listing. Based on the assurances in that deal, the FWS decided in 2015 not to list the bird.

Since then, however, sage-grouse numbers and sagebrush habitat have continued to decline. As part of its effort to invigorate industries like mining and fossil-fuel extraction, the Trump administration dramatically weakened protections that were central to the 2015 agreement and aggressively leased much of the bird’s best habitat. Courts have since intervened, putting the administration’s rollbacks on hold and invalidating many of those controversial leases.

If the no-listing rider returns to the spending bill, states that host sage-grouse will have less incentive to reverse those losses by getting tough on industries important to their economies but threatening to the bird, says Brian Rutledge, recently retired director of Audubon’s Sagebrush Ecosystem Initiative. “The fact that we removed the threat of listing removed a lot of the pressure on the states to do their share,” he says. “If they don’t think the bird can get listed, they don’t think they need to focus on it.”

The Biden administration, meanwhile, is preparing its own approach to managing the species. In a May update on its website, the Bureau of Land Management said it is working with other agencies “to assess the best available science and what actions are needed to conserve sage-grouse and sagebrush.”

Biden’s budget plan for the next fiscal year removes the sage-grouse rider. If Congress follows suit, a listing for the species will once again be a real possibility. How stakeholders across the West respond to that new reality will shape the future for this vulnerable bird and its vanishing sagebrush home.

#### Fiat makes the plan a “must pass” measure because its durable–unrelated riders get attached

Copeland 8 (Curtis W. Copeland, Specialist in American National Government, Government and Finance Division, CRS Report for Congress, “Congressional Influence on Rulemaking and Regulation Through Appropriations Restrictions” August 5)

Although the substantive reasons leading to the adoption of these regulatory restrictions are numerous (e.g., economic interests, or to support or oppose end-ofadministration rules), their inclusion in appropriations legislation as a matter of legislative strategy appears to be prompted by two factors: (1) Congress’ ability via its “power of the purse” to control agency action, and (2) the fact that appropriations bills are considered “must pass” legislation. As one observer put it, “Because everyone knows that Congress must pass such legislation, it is tempting to try and attach incidental provisions that otherwise might lack the political momentum (or even majority support) necessary for passage.”119 In that regard, several of the regulatory restrictions discussed in this report were also in separate legislation that had not moved since they were introduced. The use of regulatory restrictions in appropriations bills is also likely to continue for the foreseeable future. The examples provided in this report indicate that they are a formidable “tool” in the “toolbox” of congressional oversight and control of executive agencies.

#### Sage-grouse conservation spills over to the other wildlife and the water-cycle.

USFWS “Why Care About America’s Sagebrush?” 2013 US Fish and Wildlife Service <https://www.fws.gov/mountain-prairie/factsheets/sage-steppe_022814.pdf> SM

Conservation Value Despite the significant values it provides to wildlife and humans, the sage-steppe ecosystem is one of the most imperiled ecosystems in America. Recently, the prospect of a Greater sage-grouse Endangered Species Act listing has brought additional attention to the state of the sage- steppe ecosystem. This iconic bird’s habitat has been fragmented by development of sagebrush environments and there has been a considerable loss of suitable sagebrush habitat to support the bird’s life history, including its needs for food, cover and nesting space. The fragmentation has been exacerbated by invasive weeds, especially cheatgrass, which fuels unchecked wildfires; and, land-management practices that preclude restoration of large, contiguous blocs of sagebrush. Indeed, very little of this unique ecosystem has been undisturbed or unaltered in the past two centuries.

Fragmentation of sagebrush habitats can have a particularly acute impact on wildlife because in the arid west, food, cover and water resources are distributed unequally across the landscape. This characteristic of sagebrush means many obligate species have evolved to require very large areas of intact habitat to meet their seasonal and annual resource needs. Therefore, a relatively small number of fragmented sagebrush acres can have a disproportionate impact on the species that need that particular habitat to survive.

The sagebrush that dominates the sage-steppe landscape plays a critical role in the hydrologic cycle of the arid West. Sagebrush itself often serves as a “nurse” plant for other plants, many of which are important to sustaining grazing wildlife and domestic livestock. In addition to the hundreds of birds, mammals, reptiles and amphibians that depend on sagebrush, many unique insects, spiders, plants and lichens are associated with the sagebrush community. Imperiled wildlife, especially sagebrush obligate species; grazing livestock, especially cattle; and, some people whose livelihoods depend on healthy sagesteppe have been impacted by the loss of sage-steppe ecosystem. Over time, usage of sagebrush by people, especially fragmentation of the sagebrush lands, has altered the sage-steppe landscape, resulting in a loss of the unique biodiversity associated with this habitat type. Consequences for wildlife include declines in the populations of both game and non-game species. Consequences for people include more restrictive regulatory scenarios to protect wildlife that, in turn, place more stringent controls on economic activities, especially extractive activities such as energy and minerals development.

#### Renewed conservation efforts are key to ecosystem stability and agriculture in the American West.

Holloran and Pew 18 January 18, 2018 Interview with Matt Holloran “Sage-Grouse Scientist Stresses the Importance of Habitat Protections” <https://www.pewtrusts.org/en/research-and-analysis/articles/2018/01/sage-grouse-scientist-stresses-the-importance-of-habitat-protections> SM

We sat down with Holloran to ask a few questions about the importance of science in protecting the greater sage-grouse, and conserving the iconic sagebrush sea of the American West that is vital habitat to more than 350 species.

Q: Why should we care about the greater sage-grouse?

A: Beyond the fact that sage-grouse are an awe-inspiring species supremely adapted to thrive in one of the harshest climates in North America, as the sage-grouse goes so goes the Western way of life. Healthy sage-grouse populations indicate that sagebrush habitats are healthy; and healthy sagebrush habitats are crucial for thriving big game—elk, deer, and pronghorn in particular—and livestock populations vital to the outdoor recreation and agricultural industries that are the sustaining economic drivers of most Western communities.

Q: What kinds of habitat requirements does the bird have?

Matt Holloran

A: As the name implies, sage-grouse require sagebrush. Sage-grouse spend the majority of the year in habitats dominated by sagebrush, and eat sagebrush almost exclusively during the fall, winter, and early spring. Without sagebrush, there will not be sage-grouse. Within these sagebrush habitats, a good understory of native grasses and forbs—herbaceous plants—provide additional protection from predators and food resources important during nesting and when raising chicks. A diversity of grasses and forbs also supports a diversity of insects, which are a critical food source for young chicks. During the summer, sage-grouse move into wet areas dispersed throughout the sagebrush landscape where they feed predominantly on forbs while relying on nearby sagebrush stands for escape and thermal cover.

Q: What kinds of activities are harmful to the bird?

A: The easiest way to think about it is that sage-grouse do not like human activity or commotion. The most researched example is the sage-grouse response to gas and oil development; the birds do not do well in habitats close to gas wells or in landscapes with a lot of gas wells. Also, activities that degrade or eliminate sagebrush habitats such as improper livestock grazing and large-scale fires that are becoming more and more prevalent as a result of the proliferation of exotic annual grasses, primarily cheatgrass, will negatively affect sage-grouse populations.

#### Conservation in the West is key to national food supply.

Morici 8/24 “Western droughts imperil the nation’s food supply” Peter Morici August 24, 2021 <https://www.washingtontimes.com/news/2021/aug/24/western-droughts-imperil-the-nations-food-supply/> SM

Western droughts imperil the nation’s food supply

More comprehensive federal-state planning is needed

The American West is witnessing a climate disaster. The 21-year drought is the second-worst since the year 800.

Regional authorities planned reasonably well but what’s happening in the West is not a millennial event. Thanks to global warming, a more arid climate, and scorching temperatures are now a permanent condition. Solutions require federal involvement, not merely to see farmers and municipalities through the next few years, but to harden infrastructure and promote patterns of conservation in the national interest.

Rivers won’t be low and thermometers won’t reach new highs each year, because dry conditions and heat won’t be annually exacerbated by shifts in the jet stream and ocean currents. Those created the heat domes in the West and massive flooding in China, Germany, Belgium, and elsewhere.

Larger and more intense forest fires, water shortages, and lost hydroelectric capacity will occur with greater frequency. The West is making tough choices that make sense to the region but perhaps not for the whole country.

Western states have supported booming cities and agriculture for more than a century with complex systems of damns, reservoirs, canals, and by tapping groundwater.

Most compelling is the Hoover Dam. Completed in 1935 at a junction between Arizona and Nevada, it tamed the mighty Colorado River and created the nation’s largest artificial store of water at Lakes Meade and Powell. Those are currently at about one-third capacity.

Slipping fast are California’s reservoirs—Shasta, Orville, San Luis, and others, and those patterns repeat throughout the West.

Many reservoirs are replenished each spring by mountain snow melts. With higher winter temperatures, less snow accumulates, and the dry ground, trees, and other plants absorb more water before it gets to streams or sinks deeper into aquafers. Higher temperatures cause more evaporation in river systems and lakes.

The upper Midwest faces more frequent droughts too. The Ogallala Aquifer, which supports farming from Texas to South Dakota, is depleting.

Over the last century, water allocations have permitted farmers and ranchers to prosper, and the nation and the world have become increasingly dependent on western fruits and vegetables, cattle, and other commodities—that cannot be easily reversed.

The Northeast was much more food self-sufficient 150 years ago, but the opening of the Midwest for crops like wheat and corn and transcontinental rail transportation and refrigeration created new dependencies. Farmland in the East became suburban subdivisions and forests again. In many places, that cannot be easily reversed.

This interstate trade is based on comparative advantage—California and Arizona have more winter sunshine and fewer field stones than New England—and regional specialization that has taken global proportions. California grows 80 percent of the world’s almonds, but now the lack of water is forcing farmers to abandon orchards.

#### US food security is key to global peace.

Castellaw 17 “Opinion: Food Security Strategy Is Essential to Our National Security” 05/01/17 John Castellaw [Lieutenant General John Castellaw is the Founder and CEO of Farmspace Systems LLC, a provider of precision agricultural aerial services and equipment. He is a highly decorated 36-year veteran of the United States Marine Corp where he participated in and led several humanitarian operations in Africa, Asia and Europe. He is also the former President of the non-profit Crockett Policy Institute where he created the “SOLDIER 2 CIVILIAN” program to help veterans find jobs in precession agriculture. He graduated from the University of Tennessee, Martin (UTM) with a degree in Agriculture.] <https://www.agri-pulse.com/articles/9203-opinion-food-security-strategy-is-essential-to-our-national-security> SM

Opinion: Food Security Strategy Is Essential to Our National Security

Editor's Note: Agri-Pulse and The Chicago Council on Global Affairs are teaming up to host a monthly column to explore how the U.S. agriculture and food sector can maintain its competitive edge and advance food security in an increasingly integrated and dynamic world.

The United States faces many threats to our National Security. These threats include continuing wars with extremist elements such as ISIS and potential wars with rogue state North Korea or regional nuclear power Iran. The heated economic and diplomatic competition with Russia and a surging China could spiral out of control. Concurrently, we face threats to our future security posed by growing civil strife, famine, and refugee and migration challenges which create incubators for extremist and anti-American government factions. Our response cannot be one dimensional but instead must be a nuanced and comprehensive National Security Strategy combining all elements of National Power including a Food Security Strategy.

An American Food Security Strategy is an imperative factor in reducing the multiple threats impacting our National wellbeing. Recent history has shown that reliable food supplies and stable prices produce more stable and secure countries. Conversely, food insecurity, particularly in poorer countries, can lead to instability, unrest, and violence.

Food insecurity drives mass migration around the world from the Middle East, to Africa, to Southeast Asia, destabilizing neighboring populations, generating conflicts, and threatening our own security by disrupting our economic, military, and diplomatic relationships. Food system shocks from extreme food-price volatility can be correlated with protests and riots. Food price related protests toppled governments in Haiti and Madagascar in 2007 and 2008. In 2010 and in 2011, food prices and grievances related to food policy were one of the major drivers of the Arab Spring uprisings. Repeatedly, history has taught us that a strong agricultural sector is an unquestionable requirement for inclusive and sustainable growth, broad-based development progress, and long-term stability.

The impact can be remarkable and far reaching. Rising income, in addition to reducing the opportunities for an upsurge in extremism, leads to changes in diet, producing demand for more diverse and nutritious foods provided, in many cases, from American farmers and ranchers. Emerging markets currently purchase 20 percent of U.S. agriculture exports and that figure is expected to grow as populations boom.

Moving early to ensure stability in strategically significant regions requires long term planning and a disciplined, thoughtful strategy. To combat current threats and work to prevent future ones, our national leadership must employ the entire spectrum of our power including diplomatic, economic, and cultural elements. The best means to prevent future chaos and the resulting instability is positive engagement addressing the causes of instability before it occurs.

This is not rocket science. We know where the instability is most likely to occur. The world population will grow by 2.5 billion people by 2050. Unfortunately, this massive population boom is projected to occur primarily in the most fragile and food insecure countries. This alarming math is not just about total numbers. Projections show that the greatest increase is in the age groups most vulnerable to extremism. There are currently 200 million people in Africa between the ages of 15 and 24, with that number expected to double in the next 30 years. Already, 60% of the unemployed in Africa are young people.

Too often these situations deteriorate into shooting wars requiring the deployment of our military forces. We should be continually mindful that the price we pay for committing military forces is measured in our most precious national resource, the blood of those who serve. For those who live in rural America, this has a disproportionate impact. Fully 40% of those who serve in our military come from the farms, ranches, and non-urban communities that make up only 16% of our population.

Actions taken now to increase agricultural sector jobs can provide economic opportunity and stability for those unemployed youths while helping to feed people. A recent report by the Chicago Council on Global Affairs identifies agriculture development as the core essential for providing greater food security, economic growth, and population well-being.

Our active support for food security, including agriculture development, has helped stabilize key regions over the past 60 years. A robust food security strategy, as a part of our overall security strategy, can mitigate the growth of terrorism, build important relationships, and support continued American economic and agricultural prosperity while materially contributing to our Nation’s and the world’s security.

### 2

#### Text – A just government that is not the Kingdom of Denmark ought to recognize an unconditional right of workers to strike.

#### Danish intervention against the nurses’ right to strike effectively reduced strikes but motivation remains. Resurgence of nurses’ strikes clogs the healthcare industry and creates overloads hospitals.

Civicus 9/20 “GOVERNMENT PASSES EMERGENCY LAW TO HALT THE LONGEST STRIKE IN DANISH HISTORY” 9/20/21 <https://monitor.civicus.org/updates/2021/09/20/government-passes-emergency-law-halt-longest-strike-danish-history/> SM

Danish government intervenes to stop nurses' strike

On 27th August 2021, the Danish Social Democrat government passed an emergency law to halt the longest strike in Denmark's history. As reported on previously by the CIVICUS Monitor, more than 5,000 nurses went on strike on 19th June over a wage increase. More specifically, they asked for a fairer increase in wages than the 5,02 per cent over three years, which was agreed upon between social partners.

The extraordinary measure taken by the government is unusual in the Danish context, where agreements between social partners over working conditions are traditionally reached through collective bargaining.

The Employment and Equality Minister, Peter Hummelgaard Thomsen, told the press that the government's action was necessary since the social partners could not reach a compromise. On the other hand, the representative of the main nurses’ trade union, Grete Christensen, declared that she is “deeply disappointed” by the government's decision, as it decided to enforce the 5.02 percent increase over a three-year period, which was rejected by the workers. According to the union’s representative, by doing so the government failed to take political responsibility for a long-needed improvement in nurses’ working conditions.

The Danish Health Authority estimated that the strike has delayed around 35,500 surgeries and that it could take as long as two years to reduce the extraordinary backlog.

“Vi tager afstand fra arbejdsnedlæggelserne, men det er vigtigt at arbejdsgiverne lytter til budskaberne fra sygeplejerskerne. Det er udtryk for en stor frustration og utilfredshed med både arbejdsforhold og løn.” @GreteGc i @tv2newsdk #sundpol pic.twitter.com/LAQKSbCLbL

— Dansk Sygeplejeråd (@Sygeplejeraadet) September 13, 2021

Following the governments intervention, nurses staged strikes in the first week of September 2021 for an hour each day, in breach of their collective bargaining agreement. In response to this, on 9th September 2021, a Labour Tribunal court ruled that the nurses must return to work. However, some nurses who continued to stage hourly protests were fined between 56 and 86 kroner ( 8-12 Euros) per hour of missed work.

In a statement, the Danish nurses’ union, Dansk Sygeplejeråd (DSR) distanced itself from the remaining strike action.

“We have informed our members of the labour court decision and have once again stressed that the strikes in breach of the collective bargaining agreement are something we must clearly distance ourselves from, and they must stop now,” - DSR chairperson Grete Christensen.

#### Successful and efficient Danish healthcare is key to international modelling of sustainable healthcare reform.

Margo 19 “Why Denmark is reducing hospitals while we are building more” Jill Margo, Feb 19, 2019 https://www.afr.com/work-and-careers/management/why-denmark-is-reducing-hospitals-while-we-are-building-more-20190219-h1bg9d

Denmark has become a world leader in healthcare because, long before others, it realised the existing model was broken.

While other countries have been responding to growing demand by building more hospitals along traditional lines, the Danes have been reducing them.

In 1999, Denmark had 98 hospitals. Today it has 32.

"About 15 years ago, we realised the solution to these problems is not more hospitals but to think about how we can deliver healthcare in a different way," says Hans Erik Henriksen, CEO of Healthcare DENMARK. Janie Barrett

The Australian Financial Review Healthcare Summit in Sydney was told on Tuesday that against some domestic opposition, the Danish health system was radically transformed to make it financially sustainable for the multiple challenges ahead.

All first-world countries are facing the same challenges from an ageing population with more chronic disease among a fast-food generation with lifestyle issues that lead to chronic illness.

While this puts pressure on health budgets, so does the emergence of informed patients with larger expectations and research, technology and innovation proffering expensive new treatments.

Rethinking healthcare

"About 15 years ago, we realised the solution to these problems is not more hospitals but to think about how we can deliver healthcare in a different way," says Hans Erik Henriksen, CEO of Healthcare DENMARK.

"We aim to deliver as many services as possible through primary healthcare, municipalities, health centres and outpatient clinics and as little healthcare as possible from our hospitals.

"The future role of the hospital is thought of as the place you go to when you finally need highly specialised healthcare services. The philosophy is to handle all other kinds of problems through primary care and add to the stronghold of the GP, municipalities and clinics."

In 1999, Denmark had 98 hospitals. Today it has 32. Glenn Hunt

In Denmark the GP is the gatekeeper of healthcare, concluding nine out of 10 issues that arise.

Healthcare DENMARK is a public-private partnership organisation, mandated to promote Danish healthcare solutions abroad.

It paves the way for Danish health companies to do business abroad – attend conferences to spread the news of Danish success in healthcare transformation and host visiting delegations to Denmark.

Through its patron, Princess Mary, it has an Australian connection.

When Henriksen showed the Australian audience a slide that boldly instructed patients to "Stay at Home", a titter ran through the room.

The slogan was from the Danish Ministry of Finance promoting a health system where services are offered at the lowest efficient cost, where there are more nurses and health workers on the ground and in patients' homes.

"The rationale behind the restructuring of the hospital system is based on quality and productivity. We have learned that if you have hospitals that open the door for any patient and say "come in, let's see what we can do with you", you will receive patients for whom the hospital may not have the necessary experience."

Speciality hospitals

Instead, a map of speciality hospitals has been drawn up across the country and doctors and the ambulance services know whether the patient should go to specialised orthopaedic, cancer or cardiac hospitals.

Restructuring wasn't easy. "Of course, when you close hospitals there is uproar from the local community. In the beginning it was very powerful and politicians backed down," he says.

"They kept the hospital open but years later the building was there but its role had changed – it may have become a rehabilitation hospital."

Tensions eventually eased and after a couple of years the public began preferring specialist hospitals.

He explained how his personal experience of the healthcare system had changed.

"Twenty years ago, if I went to the GP, typically he was sitting alone in his office. If I needed a blood test I'd be sent off to the hospital. Then I would get an appointment two weeks later to see him.

"Today GPs are in groups of four or five, with nurses and labs. I'll see a GP and then wait maybe 15 minutes before the lab takes my test. Two days later, I'll see the results in my electronic health record and with it, maybe, notes from the GP telling me what I have to do.

"As a patient, you spend less time travelling around the healthcare system. Many issues are solved through digitalisation and you feel the coherence of the system."

Denmark has embarked on a new $10.5 billion phase in healthcare reform to develop 16 new super specialised hospitals as the backbone of its future hospital structure.

This phase will see patients as active participants, taking more responsibility for becoming educated about their health, while the system works on making them feel heard.

Denmark's goldmine of electronic data about the population, going back 30 years, has given it a head start. So has the fact that its healthcare IT strategy is linked to the public sector IT strategy.

By November 2014, all Danes had to get an electronic mailbox because letters from public authorities would no longer be sent by snail mail.

Hendriksen says the elderly have rapidly become online users and one aim was for all Danes to have a doctor in their pocket. This is not smartphone access to Google but an instrument for their digital relationship with their GP.

Crucial to the success of the reform is trust. To date, he says, Denmark has the finest cyber security in the world.

#### Specifically true for digital healthcare.

HCD 18 HealthCare DENMARK [a public-private non-profit partnership with the Danish government] “Digital Health Strategy 2018-2022” 2018 <https://sundhedsdatastyrelsen.dk/da/diverse/download> SM

Denmark has a sound foundation on which to continue digitising its health system. We have established digital solutions in Denmark that lead the way internationally. At the same time, it is essential that we work together to continue these developments. The aim is that patients should experience the health system as a coherent and trustworthy health betwork for all that is both inherently digital and inherently personal.

The Digital Health Strategy 2018–2022 arises from the 2018 financial agreements entered into by the Government, the Danish Regions and Local Government Denmark. The strategy must ensure the continued momentum towards a more holistic effort to enable hospitals, municipal health services, the GP's and other public and private participants throughout the health system to cooperate in an integrated network focused around patients. The overall aim of the strategy is to support the healthcare actors in taking responsibility for interconnecting the patient pathways across the individual interactions with the health care sector. Digitisation enables more tasks to be performed close to patients in a personalised and coherent health system, which looks at the person as a whole, not just at the individual diagnosis.

The strategy aims at jointly succeeding in providing cross-sectoral healthcare. Simultaneously, substantial efforts are being implemented locally and within the individual segments, which help achieve the strategy’s goals for change. The regions are investing in developing and replacing the electronic health record systems and the municipalities are radically changing the way they use health data by implementing structured electronic care records The Common Language Platform project. The GP's are also in the process of further digitising and upgrading its IT - systems to facilitate GP interaction with patients and provide a better overview. The Digital Health Strategy is built on this and lays the groundwork for a joint digitisation effort for the entire health system. This joint effort and the local efforts are mutually vital to achieving strong digital coherence for patients across the health system.

#### Digital healthcare solves future pandemics.

Chaudhry 7/6 “Planning for Future Pandemics” MUHAMMAD ALI CHAUDHRY, M.D., MBA, July 06, 2021 <https://www.itnonline.com/article/planning-future-pandemics> SM

The role of digital health solutions in preparing for future epidemics and pandemics

The unprecedented impacts and consequential social, economic and humanitarian needs introduced or exacerbated by COVID-19 are driving the rapid development and adoption of new digital technologies and at scale. These technologies are also being harnessed to support the public health response worldwide, and the resultant trajectory for digital health solutions has accelerated with greater innovation, investment and mobilization over the past year.

It is a moment of opportunity for transformation; to address systemic weaknesses — insufficiencies and inefficiencies across the spectrum of care, in a way that allows for a sustainable redesign of care delivery.

This pandemic has forced a deeper consideration of healthcare delivery beyond an individual patient focus to a broader lens that looks at implications within and across communities, regions and countries. The development and application of digital solutions needs to emerge from the same lens.

Building the Future of Healthcare

The future state of healthcare needs to be agile and enable flexible and adaptive health practices that can respond to new information or changing trends, continuously improve processes to deliver more value and effectively adopt new technologies to enhance care. Agile health systems will need to involve and interact key system components — infrastructure, workforce and both patient-centric and business-centric digital technologies — that will complement the development of a sensing and responding system.

This means that digital strategies need to be aligned to strengthen pandemic management, but also with a long-term view to building resilient health systems as well as future emergency preparedness.

The key is in patient data, health information and information-sharing. There is a huge potential that digital holds to support epidemiological intelligence, identify cases and cluster infection, rapidly trace contacts, and enable public health messaging at scale. This is critical during a pandemic but can also have transformative impact for public health outside of the pandemic context.

Digtial Infrastructure

Digital technologies have numerous applications that provide both patient-centric and business-centric solutions, such as preventive and promotive healthcare, patient monitoring and program management, and electronic medical record systems. This is where the following key enablers become very important:

Data availability and accessibility within a community

System interoperability to support the development of a coordinated response

Connectivity to drive agile and rapid information exchange

Accessibility and availability of data pulled from multiple sources is the first step toward achieving an aggregated or holistic view of an individual patient’s health scenario and therefore, a much better understanding of their symptoms and needs. It helps discern trends and patterns within a community. It also means that the most appropriate diagnosis can be made according to a patient's specific health situation. This is especially important for those patients or communities who may be in vulnerable or dire situations. Alongside evidence-based care, quality local data informs sound resource allocation and supports efforts for optimal health outcomes.

Interoperability allows different information technology systems within hospitals and across hospital systems and broader public and private healthcare networks to connect and communicate with one another; to exchange data accurately and consistently; and to use that information effectively. It offers the ability to access and share a patient's clinical information no matter where it is stored or how it is formatted. If aligned effectively, both patients and providers benefit with a safe, secure and seamless access to patient information and vital data.

Connectivity combined with robust interoperability also enables speed within a health system. Connecting various care delivery setups is critical in reaching out to a larger population. This requires a decentralized and flexible approach to expand connectivity. In the context of a pandemic, interoperable EMR systems at every level, for example, would allow access and data sharing across the continuum of care, facilitate better monitoring and reporting of suspected and confirmed cases, treatment regimens and abnormal conditions. This way of exchanging information is agile, permits a quicker understanding of a pandemic’s behavior within a given population and, therefore, enables faster and more comprehensive containment or mitigation interventions.

Analysis and use of these data will depend on the digital infrastructure and readiness of health systems, including an enabling legal and regulatory environment, information governance, incentives to prioritize interoperability, data protection and cybersecurity. Optimal benefits will emerge from collaboration across health ecosystems to address fragmentation. Public-private partnerships and collaborations with civil society and technical communities are growing to enable shared resources and capabilities that will bring the potential for greater social and economic value; industry collaboration is needed to enhance connectivity and interoperability and drive healthcare data integration; development of regulation that keeps up with innovations, or better yet, drives innovation is essential; and greater and stable government investment in digital health can help drive scale.

#### Pandemics cause Extinction

Bar-Yam 16 Yaneer Bar-Yam 7-3-2016 “Transition to extinction: Pandemics in a connected world” <http://necsi.edu/research/social/pandemics/transition> (Professor and President, New England Complex System Institute; PhD in Physics, MIT)//Elmer

Watch as one of the more aggressive—brighter red — strains rapidly expands. After a time it goes extinct leaving a black region. Why does it go extinct? The answer is that it spreads so rapidly that it kills the hosts around it. Without new hosts to infect it then dies out itself. That the rapidly spreading pathogens die out has important implications for evolutionary research which we have talked about elsewhere [1–7]. In the research I want to discuss here, what we were interested in is the effect of adding long range transportation [8]. This includes natural means of dispersal as well as unintentional dispersal by humans, like adding airplane routes, which is being done by real world airlines (Figure 2). When we introduce long range transportation into the model, the success of more aggressive strains changes. They can use the long range transportation to find new hosts and escape local extinction. Figure 3 shows that the more transportation routes introduced into the model, the more higher aggressive pathogens are able to survive and spread. As we add more long range transportation, there is a critical point at which pathogens become so aggressive that the entire host population dies. The pathogens die at the same time, but that is not exactly a consolation to the hosts. We call this the phase transition to extinction (Figure 4). With increasing levels of global transportation, human civilization may be approaching such a critical threshold. In the paper we wrote in 2006 about the dangers of global transportation for pathogen evolution and pandemics [8], we mentioned the risk from Ebola. Ebola is a horrendous disease that was present only in isolated villages in Africa. It was far away from the rest of the world only because of that isolation. Since Africa was developing, it was only a matter of time before it reached population centers and airports. While the model is about evolution, it is really about which pathogens will be found in a system that is highly connected, and Ebola can spread in a highly connected world. The traditional approach to public health uses historical evidence analyzed statistically to assess the potential impacts of a disease. As a result, many were surprised by the spread of Ebola through West Africa in 2014. As the connectivity of the world increases, past experience is not a good guide to future events. A key point about the phase transition to extinction is its suddenness. Even a system that seems stable, can be destabilized by a few more long-range connections, and connectivity is continuing to increase. So how close are we to the tipping point? We don’t know but it would be good to find out before it happens. While Ebola ravaged three countries in West Africa, it only resulted in a handful of cases outside that region. One possible reason is that many of the airlines that fly to west Africa stopped or reduced flights during the epidemic [9]. In the absence of a clear connection, public health authorities who downplayed the dangers of the epidemic spreading to the West might seem to be vindicated. As with the choice of airlines to stop flying to west Africa, our analysis didn’t take into consideration how people respond to epidemics. It does tell us what the outcome will be unless we respond fast enough and well enough to stop the spread of future diseases, which may not be the same as the ones we saw in the past. As the world becomes more connected, the dangers increase. Are people in western countries safe because of higher quality health systems? Countries like the U.S. have highly skewed networks of social interactions with some very highly connected individuals that can be “superspreaders.” The chances of such an individual becoming infected may be low but events like a mass outbreak pose a much greater risk if they do happen. If a sick food service worker in an airport infects 100 passengers, or a contagion event happens in mass transportation, an outbreak could very well prove unstoppable.

### 4

#### Interpretation – the affirmative must defend the hypothetical enactment of the resolution. This necessitates defending the implementation of a topical plan.

#### To clarify, the aff may read any normative f/w to evaluate the moral goodness of the plan.

#### “Resolved” before a colon reflects a legislative forum

**Army Officer School 4** (5-12, “# 12, Punctuation—The Colon and Semicolon”, http://usawocc.army.mil/IMI/wg12.htm)

The colon introduces the following: a.  A list, but only after "as follows," "the following," or a noun for which the list is an appositive: Each scout will carry the following: (colon) meals for three days, a survival knife, and his sleeping bag. The company had four new officers: (colon) Bill Smith, Frank Tucker, Peter Fillmore, and Oliver Lewis. b.  A long quotation (one or more paragraphs): In The Killer Angels Michael Shaara wrote: (colon) You may find it a different story from the one you learned in school. There have been many versions of that battle [Gettysburg] and that war [the Civil War]. (The quote continues for two more paragraphs.) c.  A formal quotation or question: The President declared: (colon) "The only thing we have to fear is fear itself." The question is: (colon) what can we do about it? d.  A second independent clause which explains the first: Potter's motive is clear: (colon) he wants the assignment. e.  After the introduction of a business letter: Dear Sirs: (colon) Dear Madam: (colon) f.  The details following an announcement For sale: (colon) large lakeside cabin with dock g.  A formal resolution, after the word "resolved:" Resolved: (colon) That this council petition the mayor.

#### 1. Core controversy – the mechanics of the \_\_\_\_\_ debate matter. The biggest debate is about feasibility. Court clog, circumvention, spending, enforcement are key negative arguments their interp excludes.

#### 2. Debating the topic is good. Make them read evidence that supports their entire interp not just random parts of it.

#### A. Preparation- repacking the topic gives the aff a huge edge, they can prepare for months on an issue that catches us by surprise. Preparation is better than thinking on your feet- research demonstrates pedagogical humility and research skills are the only portable debate training

#### B. there are a finite amount of plausible aff plans, but an infinite number of philosophical principles within a topic area. Tying philosophical principles to the mechanics of a plan is key to a predictable point of stasis necessary to ensuring adequate negative ground.

#### 3. Preempts:

#### A. applied ethics is good – their interp forces us into extremist philosophical stances no one defends. Whereas applying ethics through a plan allows us to see how theories apply to our actual lives.

#### B. TVA - EXPLAIN

#### D. Topicality is a voting issue that should be evaluated through competing interpretations: it tells the negative what they do and do not have to prepare for. Non topical affirmatives overstretch research and detract from the quality of all rounds. Topicality is also a stock issue and puts the affirmative outside your jurisdiction, which also proves NO Rvi’s b/c they shouldn’t win for meeting the bare minimum. Also RVI’s disincentive checking abuse which makes unfair practices more prevalent and likely to win.

### Hedge

#### 1AR theory is skewed towards the aff – a) the 2NR must cover substance and over-cover theory, since they get the collapse and persuasive spin advantage of the 3min 2AR, b) their responses to my counter interp will be new, which means 1AR theory necessitates intervention. Implications – a) reject 1AR theory since it can’t be a legitimate check for abuse, b) drop the arg to minimize the chance the round is decided unfairly, c) use reasonability with a bar of defense or the aff always wins since the 2AR can line by line the whole 2NR without winning real abuse

Condos good – neg flex bredth of ed strategic thinking

Their args

Illegitimate check on abuse/requires infinite abuse

Deterrence empirically denied

Reject nc hedge incoherent if we’re winning 1ar theory doesn’t check abuse

## Case

#### Framework – the role of the ballot is to determine whether the plan is a good idea through evaluation of consequences —anything else is self-serving, arbitrary and begs the question of the rest of the debate.

Their args

#### No VTL Claims - jurisdiction

#### The ballot fails as a mechanism for change

Ritter 13. JD from U Texas Law (Michael J., “Overcoming The Fiction of “Social Change Through Debate”: What’s To Learn from 2pac’s Changes?,” National Journal of Speech and Debate, Vol. 2, Issue 1

The structure of competitive interscholastic debate renders any message communicated in a debate round virtually incapable of creating any social change, either in the debate community or in general society. And to the extent that the fiction of social change through debate can be proven or disproven through empirical studies or surveys, academics instead have analyzed debate with nonapplicable rhetorical theory that fails to account for the unique aspects of competitive interscholastic debate. Rather, the current debate relating to activism and competitive interscholastic debate concerns the following: “What is the best model to promote social change?” But a more fundamental question that must be addressed first is: “Can debate cause social change?” Despite over two decades of opportunity to conduct and publish empirical studies or surveys, academic proponents of the fiction that debate can create social change have chosen not to prove this fundamental assumption, which—as this article argues—is merely a fiction that is harmful in most, if not all, respects. The position that competitive interscholastic debate can create social change is more properly characterize5d as a fiction than an argument. A fiction is an invented or fabricated idea purporting to be factual but is not provable by any human senses or rational thinking capability or is unproven by valid statistical studies. An argument, most basically, consists of a claim and some support for why the claim is true. If the support for the claim is false or its relation to the claim is illogical, then we can deduce that the particular argument does not help in ascertaining whether the claim is true. Interscholastic competitive debate is premised upon the assumption that debate is argumentation. Because fictions are necessarily not true or cannot be proven true by any means of argumentation, the competitive interscholastic debate community should be incredibly critical of those fictions and adopt them only if they promote the activity and its purposes

#### 1] Don’t let them weigh the sum total of their impact—they only get to weigh the unique amount solved by the affirmative. Filter the debate through scope of solvency—there’s no impact to root cause if they don’t solve it

#### 2] No performative or methodological offense, only offense from the plan—reject it cuz it explodes predictable limits, spiking out of neg ground making any discussion qualitatively worse

#### 3] Our impacts matter

#### A] Focus on large scale catastrophes is good and they outweigh – appeals to social costs, moral rules, and securitization play into cognitive bias and flawed risk calculus – 2020 is living proof

Weber 20 (ELKE U. WEBER is Gerhard R. Andlinger Professor in Energy and the Environment and Professor of Psychology and Public Affairs at Princeton University.), November-December 2020 Issue, "Heads in the Sand," Foreign Affairs, <https://www.foreignaffairs.com/articles/2020-10-13/heads-sand> mvp

We are living in a time of crisis. From the immediate challenge of the COVID-19 pandemic to the looming existential threat of climate change, the world is grappling with massive global dangers—to say nothing of countless problems within countries, such as inequality, cyberattacks, unemployment, systemic racism, and obesity. In any given crisis, the right response is often clear. Wear a mask and keep away from other people. Burn less fossil fuel. Redistribute income. Protect digital infrastructure. The answers are out there. What’s lacking are governments that can translate them into actual policy. As a result, the crises continue. The death toll from the pandemic skyrockets, and the world makes dangerously slow progress on climate change, and so on.

It’s no secret how governments should react in times of crisis. First, they need to be nimble. Nimble means moving quickly, because problems often grow at exponential rates: a contagious virus, for example, or greenhouse gas emissions. That makes early action crucial and procrastination disastrous. Nimble also means adaptive. Policymakers need to continuously adjust their responses to crises as they learn from their own experience and from the work of scientists. Second, governments need to act wisely. That means incorporating the full range of scientific knowledge available about the problem at hand. It means embracing uncertainty, rather than willfully ignoring it. And it means thinking in terms of a long time horizon, rather than merely until the next election. But so often, policymakers are anything but nimble and wise. They are slow, inflexible, uninformed, overconfident, and myopic.

Why is everyone doing so badly? Part of the explanation lies in the inherent qualities of crises. Crises typically require navigating between risks. In the COVID-19 pandemic, policymakers want to save lives and jobs. With climate change, they seek a balance between avoiding extreme weather and allowing economic growth. Such tradeoffs are hard as it is, and they are further complicated by the fact that costs and benefits are not evenly distributed among stakeholders, making conflict a seemingly unavoidable part of any policy choice. Vested interests attempt to forestall needed action, using their money to influence decision-makers and the media. To make matters worse, policymakers must pay sustained attention to multiple issues and multiple constituencies over time. They must accept large amounts of uncertainty. Often, then, the easiest response is to stick with the status quo. But that can be a singularly dangerous response to many new hazards. After all, with the pandemic, business as usual would mean no social distancing. With climate change, it would mean continuing to burn fossil fuels.

But the explanation for humanity’s woeful response to crises goes beyond politics and incentives. To truly understand the failure to act, one must turn to human psychology. It is there that one can grasp the full impediments to proper decision-making—the cognitive biases, emotional reactions, and suboptimal shortcuts that hold policymakers back—and the tools to overcome them.

AVOIDING THE UNCOMFORTABLE

People are singularly bad at predicting and preparing for catastrophes. Many of these events are “black swans,” rare and unpredictable occurrences that most people find difficult to imagine, seemingly falling into the realm of science fiction. Others are “gray rhinos,” large and not uncommon threats that are still neglected until they stare you in the face (such as a coronavirus outbreak). Then there are “invisible gorillas,” threats in full view that should be noticed but aren’t—so named for a psychological experiment in which subjects watching a clip of a basketball game were so fixated on the players that they missed a person in a gorilla costume walking through the frame. Even professional forecasters, including security analysts, have a poor track record when it comes to accurately anticipating events. The COVID-19 crisis, in which a dystopic science-fiction narrative came to life and took everyone by surprise, serves as a cautionary tale about humans’ inability to foresee important events.

Not only do humans fail to anticipate crises; they also fail to respond rationally to them. At best, people display “bounded rationality,” the idea that instead of carefully considering their options and making perfectly rational decisions that optimize their preferences, humans in the real world act quickly and imperfectly, limited as they are by time and cognitive capacity. Add in the stress generated by crises, and their performance gets even worse.

Because humans don’t have enough time, information, or processing power to deliberate rationally, they have evolved easier ways of making decisions. They rely on their emotions, which serve as an early warning system of sorts: alerting people that they are in a positive context that can be explored and exploited or in a negative context where fight or flight is the appropriate response. They also rely on rules. To simplify decision-making, they might follow standard operating procedures or abide by some sort of moral code. They might decide to imitate the action taken by other people whom they trust or admire. They might follow what they perceive to be widespread norms. Out of habit, they might continue to do what they have been doing unless there is overwhelming evidence against it.

Not only do humans fail to anticipate crises; they also fail to respond rationally to them.

Humans evolved these shortcuts because they require little effort and work well in a broad range of situations. Without access to a real-time map of prey in different hunting grounds, for example, a prehistoric hunter might have resorted to a simple rule of thumb: look for animals where his fellow tribesmen found them yesterday. But in times of crisis, emotions and rules are not always helpful drivers of decision-making. High stakes, uncertainty, tradeoffs, and conflict—all elicit negative emotions, which can impede wise responses. Uncertainty is scary, as it signals an inability to predict what will happen, and what cannot be predicted might be deadly. The vast majority of people are already risk averse under normal circumstances. Under stress, they become even more so, and they retreat to the familiar comfort of the status quo. From gun laws to fossil fuel subsidies, once a piece of legislation is in place, it is hard to dislodge it, even when cost-benefit analysis argues for change.

### Top

#### They say they solve environmental action

#### CO2 is key to food production and biodiversity – it’s faster than their impacts.

Goklany 15 Indur, PhD, was a member of the US delegation that established the IPCC and helped develop its First Assessment Report, Fellow at the Political Economy Research Center, Senior Adviser for Program Coordination at the U.S. Interior Department’s Office of Policy Analysis, Global Warming Policy Foundation, October 2015, “CARBON DIOXIDE The good news”, http://www.thegwpf.org/content/uploads/2015/10/benefits1.pdf

That carbon dioxide is plant food has been known since the publication in 1804 of Nicolas-Théodore de Saussure’s Recherches Chimiques sur la Végétation. 12 Thousands of experiments since then have shown that the majority of plants grow faster and larger, both above and below ground, if they are exposed to higher carbon dioxide concentrations. The owners of commercial greenhouses routinely pump in carbon dioxide so as to enhance the growth rates of plants, and the optimal level for plant growth is considered to be between 700 and 900 parts per million (ppm),13 roughly twice today’s ambient concentration of 400 ppm. However, plants may continue to respond positively at even higher carbon dioxide levels. For some species such as loblolly pine14 and cuphea,15 growth tops out at around 20,000 ppm or more. Indeed, it has been shown that the addition of supplemental carbon dioxide to a greenhouse enhances the growth of lettuces even if the temperature of the greenhouse is lowered, thus causing a net decrease in the carbon footprint of the operation.16 A database of peer-reviewed papers assembled from studies of the effect of carbon dioxide on plant growth by the Center for the Study of Carbon Dioxide and Global Change (CSCDGC) shows that for the 45 crops that account for 95% of global crop production, an increase of 300 ppm of carbon dioxide would increase yields by between 5% and 78%.17 The median increase for these crops was 41% and the production-weighted yield increase was 34.6%. Experiments also show that the benefits of carbon dioxide for plants are not restricted to faster and greater growth; the efficiency with which they consume water is also increased. Consequently, all else being equal, under higher carbon dioxide conditions, less water is needed to increase a plant’s biomass by any given amount. In other words, higher carbon dioxide levels increase plants’ ability to adapt to water-limited (or drought) conditions, precisely the conditions that some environmentalists claim are already occurring – notwithstanding the finding of the Intergovernmental Panel on Climate Change (IPCC) to the contrary – or will occur in the future. A recent experimental study on grasslands found that elevated levels of carbon dioxide further lengthened the growing season under warming conditions.18 The reason for the increased adaptability is that the size and density of stomata – tiny pores on the underside of leaves, which allow air, water vapour, and other gases to enter and leave the plant – are typically reduced as carbon dioxide levels increase. Thus higher carbon dioxide levels reduce water loss from the leaves. For the same reason, higher carbon dioxide levels reduce the rate at which ozone and other gases toxic to plants enter the plant, reducing the damage they inflict. In fact, Taub, in a summary article notes, ‘Across experiments with all plant species, the enhancement of growth by elevated carbon dioxide is much greater under conditions of ozone stress than otherwise’.19 The IPCC AR5 WGI report acknowledges that ‘[f]ield experiments provide a [sic] direct evidence of increased photosynthesis rates and water use efficiency...in plants growing under elevated carbon dioxide’.20 It also notes that this effect occurs in more than two thirds of the experiments and that net primary productivity (NPP) increases by about 20–25% if carbon dioxide is doubled relative to the pre-industrial level.21 Previously it had been argued that these increases might not be sustainable over the long term, but AR5 reports that new experimental evidence from long-term free-air carbon dioxide enrichment (FACE) experiments in temperate ecosystems show that these higher rates of carbon accumulation can be sustained for ‘multiple years’.22 In AR5, the IPCC says that the reduced carbon dioxide fertilisation effect seen in some experiments and the complete absence in others is ‘very likely’ due to nitrogen limitation in temperate and boreal ecosystems, and phosphorus limitation in the tropics, with a possible effect due to interaction with deficiencies of other micronu trients such as molybdenum.23 The report concludes, ‘. . .with high confidence, the carbon dioxide fertilisation effect will lead to enhanced NPP, but significant uncertainties remain on the magnitude of this effect, given the lack of experiments outside of temperate climates’. But the IPCC protests too much. It overstates the uncertainty regarding the magnitude of the effect under real world conditions. Consider managed ecosystems, particularly agriculture and forestry. Nutrient and micronutrient deficiencies are among the many routine challenges faced by farmers and foresters. Managing them is not terra incognita. Moreover, adaptations to cope with such deficiencies become more likely as technology inexorably advances and societies become wealthier, as indeed they are projected to become under all IPCC emission scenarios.24,25 Therefore, farmers and foresters should be able to adapt successfully, unless some technologies are foreclosed under a perverse application of the precautionary principle.26 Such perversity, however, cannot be ruled out given the antipathy of many environmentalists towards biotechnology. Foreclosing options such as genetically modified (GM) crops that would be more resistant to drought, water logging, or other adverse conditions will increase the likelihood that environmentalists’ warnings – that AGW will lower food production and increase hunger – become self-fulfilling prophecies. It has also been suggested that carbon dioxide enrichment inhibits the assimilation of nitrate into organic nitrogen compounds, which then may be largely responsible for carbon dioxide acclimation, and a decline in photosynthesis and growth of C3∗ plants, as well as a reduction in protein content because of the resulting increase in the carbon/nitrogen ratio.27,28,29 While the precise cause(s) and biochemical pathway(s) responsible for such acclimation are still being investigated, several approaches have been proposed to limit, if not overcome, such acclimation. These include making more nitrogen available to the plant to match the increase in carbon, for example through increased nitrogen fertilisation, greater reliance on ammonium rather than nitrate fertilizers, or improving nitrogen uptake and nitrogen-use efficiency through the development of new crop varieties via conventional breeding or bioengineering.30,31 Present-day contribution of carbon dioxide to increases in crop yields If more carbon dioxide increases the productivity of plants, how much have crop yields increased so far because of carbon dioxide increases since pre-industrial times? Currently, the carbon dioxide level is at 400 ppm (0.04%). By comparison, the preindustrial level is estimated to have been 277 ppm (0.028%).32 If one assumes that the carbon dioxide fertilisation effect on productivity increases linearly, then the AR5 estimate of a 20–25% yield increase for a doubling of carbon dioxide levels since preindustrial times translates into a 9–11% yield increase so far. Alternatively, a 34.6% increase in yield from a 300-ppm increase in carbon dioxide concentration, as calculated by the CSCDGC,† translates into a 15% yield increase due to anthropogenic emissions to date. These are underestimates if the growth response to increasing carbon dioxide levels bends downwards at higher concentrations. These estimates suggest that a portion of the crop yield increases seen in recent decades, which most observers credit to technological change, should actually be credited to carbon dioxide fertilisation. A recent econometric analysis, which pooled sixty years of historical data on US crop yields with output from FACE trials and records of temperature, precipitation, and carbon dioxide levels, estimated that significant proportions of observed yield increases could be attributed to carbon dioxide rather than technological change (see Table 1).33 These estimates suggest that the beneficial effect of carbon dioxide could be even greater than the 9–15% yield increase estimated by CSCDGC. The same study also found that higher carbon dioxide levels are associated with lower variation in yields for each crop. This is consistent with the notion that increased carbon dioxide levels reduce the sensitivity of yield to other factors (e.g. water shortages and air pollution). All else being equal, lower variation translates into a more stable supply of food, as well as more stable food prices, which benefits all consumers everywhere. Idso (2013) has attempted to translate these yield increases into a monetary value. He finds that over 50 years the extra produce grown by farmers has been $274 billion for wheat, $182 billion for maize and $579 billion for rice, and that the current value of the carbon dioxide fertilisation effect on all crops is currently about $140 billion a year. Of course, these numbers cannot be precise, but note that they are based on actual experimental data and existing yields, so they are far less speculative than monetary measures of the harm due to future climate change and its impacts on food security using models that have not been externally validated (see Section 8).34 Impact of carbon dioxide enrichment on pests and weeds All crops are engaged in a battle of attrition with fungal parasites, insect predators and plant competitors, among other pests. Human intervention to help the crops prevail, using pesticides, genetic modification or by changing agronomic practices, is the main determinant of how much of the crop is lost. However, it is possible that carbon dioxide enrichment can improve the capacity of plants to resist pests

.35 Insects do not grow faster in higher concentrations of carbon dioxide, and while some experiments show that carbon dioxide enrichment reduces crop resistance to pathogens,36 others show that it can help crops resist such enemies. For example, in one experiment doubling carbon dioxide levels in the air fully compensated for any growth reduction caused by a fungal pathogen in tomatoes.37 In another study, the parasitic weed Striga hermonthica, which devastates many crops in sub-Saharan Africa, was shown to do only half as much damage to rice yields when carbon dioxide concentrations are doubled.38 In another study, higher carbon dioxide levels were found to enhance the production of phenolic compounds in rice and, since these are known to inhibit the growth of the most noxious weeds in rice fields, the authors conclude that the rise in the air’s carbon dioxide concentration may well ‘increase plant resistance to specific weeds, pests and pathogens’.39 Moreover, many crops are C3 plants and many weeds are C4 plants, which respond less to carbon dioxide enrichment. Thus as carbon dioxide levels rise, C3 crops may enhance their growth rates more than C4 weeds do. A Chinese experiment tested this idea by enriching carbon dioxide levels over plots of rice to almost twice the ambient level. This enhanced the ear weight of the rice by 37.6% while reducing the growth of a common weed, barnyard grass, by 47.9%, because the faster-growing rice shaded the weeds.40 Figure 1 illustrates the differing responses to elevated carbon dioxide concentrations of rice, a C3 plant, and the green foxtail Setaria viridis, a grass sometimes proposed as a genetic model system to study C4 photosynthesis.41,42 It is worth noting that the vast majority of plants are C3, perhaps because higher carbon dioxide levels are more the norm in Earth’s history. Contribution of carbon dioxide to increases in biological productivity in unmanaged ecosystems As early as 1985, Bacastow and colleagues detected a steady increase in the amplitude of seasonal variation in the carbon dioxide levels in the northern hemisphere,43 and deduced that it implied an increase in summer vegetation. This was the first hint of global greening, a phenomenon now established by satellite observations. More recent aircraft-based observations of carbon dioxide above the north Pacific and the Arctic Ocean indicate that between 1958–61 and 2009–11 the seasonal amplitude at altitudes of 3–6 km increased by 25% for the northern hemisphere from 10◦N to 45◦N, and 50% from 45◦N to 90◦N.44 Satellite observations confirm that the increase in greenness of the globe is not confined to managed ecosystems (such as croplands), but is happening in unmanaged and lightly managed ecosystems too. Trend analysis of global greenness using satellite data indicates that from 1982 to 2011 – a period during which atmospheric carbon dioxide concentration increased by 15% – 31% of the global vegetated area became greener while 3% became less green (see Figure 2).45 The productivity of global ecosystems has increased by 14% in aggregate. Notably, all vegetation types have greened,46 including tropical rain forests, deciduous and evergreen boreal forests, scrubland, semi-deserts, grasslands and all other wild ecosystems, including those that do not even have indirect input of man-made nitrogen fertilizer. Some ecosystems show a relatively poorer response in NPP at higher carbon dioxide levels. The progressive nitrogen limitation (PNL) hypothesis47 argues that this is due to nitrogen deficiency. However, the human activities that are major emitters of greenhouse gases – fossil fuel consumption and the use of nitrogen fertilizers for agriculture – also emit so-called ‘reactive’ nitrogen, which can be used directly or indirectly by biological organisms to grow. The concentration of N2O has risen by 7% over those 30 years. However, the evidence regarding the PNL hypothesis is mixed.48,49,50,51,52,53,54 The increased greening detected via satellite and aircraft measurements is consistent with the increases in crop yields seen over the past 50 years or more,55,56 but also with a bottom-up estimate of changes in the amount of carbon sequestered in forests.57 These forest stock-and-flux estimates are derived from on-the-ground forest inventory data and long-term ecosystem carbon studies, and represent 3.9 billion hectares of global forests, or 95% of the total. They indicate that from 1990 to 2007 forests served as a net carbon sink, to the tune of 1.1 Pg C per year.‡ Other long-term on-the-ground observational records also find increased forest growth. For example, an analysis of data from unmanaged or lightly managed stands in central European forests, going back in some instances to 1870,§ indicates that the volume of 75-year-old stands of the dominant tree species grew 10–30% faster in 2000 than in 1960.58 The standing stock volumes were also greater in 2000 than in 1960, by 6–7%. Similarly, data ranging over 5–18 years indicate that carbon uptake increased in six out of seven forests across the northeast and midwest United States.59 However, the 14% increase in global vegetation cannot be attributed entirely to higher carbon dioxide levels and nitrogen deposition: part of it could also be due to a more equable climate for plant growth, possibly because of AGW. Donohoe et al. analyzed satellite observations after first processing them to remove the effect of variations in rainfall.60 Their results showed that the vegetation cover across arid environments, where water is the dominant constraint to growth, increased by 11% during the period 1982–2010, largely because of increased wateruse efficiency by plants at higher carbon dioxide concentrations. Unfortunately, estimates of productivity increases solely from carbon dioxide increases are not available for other ecosystems or the globe as a whole. Of course, increases in plant production are likely to result in increases in aggregate animal biomass too. In summary, higher carbon dioxide levels increase both crop yields and biosphere productivity more generally. 3 Ancillary benefits of increased biospheric productivity Improved human wellbeing Higher agricultural yields reduce food prices in general. This provides a double dividend for humanity. Firstly, it reduces chronic hunger, but secondly a reduction in chronic hunger is the first step toward improvements in public health.61,62 Reduced habitat loss and pressure on biodiversity No less important, higher yields also provide a double dividend for the rest of nature. Firstly, they free up habitat for the rest of nature, which reduces the pressure on ecosystems. Had it not been for the increase in yields of 9–15%, global cropland would have had to be increased by a similar amount to produce the same amount of food, all else being equal. That figure means that an area equivalent to the combined area of Myanmar, Thailand and Malaysia has been saved from the plough. Secondly, land that has not been appropriated by humans also produces more food for other species. Consequently, this increases the aggregate biomass – that is, the product of number of species and representatives of each species – that the planet can sustain. How much would the food available for other species have decreased in the absence of anthropogenic increases in atmospheric carbon dioxide? To calculate this figure, assume that: • the productivity of unmanaged ecosystems also increased by 9–15% because of higher carbon dioxide concentrations (as estimated for crops) • human beings currently ‘appropriate’ 25% of the earth’s NPP.63 Therefore, had there been no anthropogenic increase in carbon dioxide, satisfying current human demand for food, timber, feed for domesticated animals and other plant-derived product would have required the share of NPP available for the rest of nature to decline by 11–17%. Alternatively, if one assumes that human beings currently use 40% of global NPP64 and retain the other assumptions intact then the present share of NPP available for the rest of nature would have had to decline by 14–22%. In either case, in the absence of any carbon dioxide fertilisation there would have been a significant increase in the number of species at risk of extinction.

#### Extinction from warming requires 12 degrees, far greater than their internal link, and intervening actors will solve before then

Sebastian Farquhar 17, leads the Global Priorities Project (GPP) at the Centre for Effective Altruism, et al., 2017, “Existential Risk: Diplomacy and Governance,” https://www.fhi.ox.ac.uk/wp-content/uploads/Existential-Risks-2017-01-23.pdf

The most likely levels of global warming are very unlikely to cause human extinction.15 The existential risks of climate change instead stem from tail risk climate change – the low probability of extreme levels of warming – and interaction with other sources of risk. It is impossible to say with confidence at what point global warming would become severe enough to pose an existential threat. Research has suggested that warming of 11-12°C would render most of the planet uninhabitable,16 and would completely devastate agriculture.17 This would pose an extreme threat to human civilisation as we know it.18 Warming of around 7°C or more could potentially produce conflict and instability on such a scale that the indirect effects could be an existential risk, although it is extremely uncertain how likely such scenarios are.19 Moreover, the timescales over which such changes might happen could mean that humanity is able to adapt enough to avoid extinction in even very extreme scenarios. The probability of these levels of warming depends on eventual greenhouse gas concentrations. According to some experts, unless strong action is taken soon by major emitters, it is likely that we will pursue a medium-high emissions pathway.20 If we do, the chance of extreme warming is highly uncertain but appears non-negligible. Current concentrations of greenhouse gases are higher than they have been for hundreds of thousands of years,21 which means that there are significant unknown unknowns about how the climate system will respond. Particularly concerning is the risk of positive feedback loops, such as the release of vast amounts of methane from melting of the arctic permafrost, which would cause rapid and disastrous warming.22 The economists Gernot Wagner and Martin Weitzman have used IPCC figures (which do not include modelling of feedback loops such as those from melting permafrost) to estimate that if we continue to pursue a medium-high emissions pathway, the probability of eventual warming of 6°C is around 10%,23 and of 10°C is around 3%.24 These estimates are of course highly uncertain. It is likely that the world will take action against climate change once it begins to impose large costs on human society, long before there is warming of 10°C. Unfortunately, there is significant inertia in the climate system: there is a 25 to 50 year lag between CO2 emissions and eventual warming,25 and it is expected that 40% of the peak concentration of CO2 will remain in the atmosphere 1,000 years after the peak is reached.26 Consequently, it is impossible to reduce temperatures quickly by reducing CO2 emissions. If the world does start to face costly warming, the international community will therefore face strong incentives to find other ways to reduce global temperatures.