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REACH Update

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COVID-19

2020-04-03

To alleviate the difficulties companies and Member State authorities may be facing during the global coronavirus pandemic, ECHA is supporting EU/EEA countries and companies to ensure that disinfectants can quickly enter the market.

Together with the Commission, the Agency is also exploring the possibility of allowing more flexibility for companies in meeting certain deadlines associated to ECHA's decisions.

ECHA, 3 April 2020

<https://echa.europa.eu/covid-19>

Updates to registration dossiers not taken into account during substance evaluation decision making

2020-03-31

Once ECHA has sent a substance evaluation draft decision to registrants, the Agency and the evaluating Member States will not take dossier updates into account during decision making. If registrants have new relevant information, they need to submit it through their comments to the draft decision.

From 14 April 2020, ECHA starts applying a new policy regarding dossier updates during substance evaluation.

After ECHA has sent registrants a draft decision for commenting, the Agency and evaluating Member States no longer take dossier updates into account in their decision making. This is because registration dossiers must reflect the best knowledge of the registrants at all times and contain the most up-to-date information, in particular on the exposure and use of the substance.

If registrants have new relevant information on their substance after receiving a draft decision, they will need to submit it through their comments to the draft decision. Authorities will consider the comments and amend the draft decision, if needed.

To alleviate the difficulties companies and Member State authorities may be facing during the global coronavirus pandemic, ECHA is supporting EU/EEA countries and companies to ensure that disinfectants can quickly enter the market.

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The same approach already applies to dossier evaluation.

ECHA, 31 March 2020

<https://echa.europa.eu/-/updates-to-registration-dossiers-not-taken-into-account-during-substance-evaluation-decision-making>

Coronavirus update regarding meetings and visitors to ECHA

2020-03-17

The World Health Organisation (WHO) has declared the coronavirus outbreak a global pandemic. ECHA is closely following authorities' advice to avoid the spreading of coronavirus and is undertaking the following measures:

All meetings, including meetings of formal ECHA bodies, with external participants from abroad should be held remotely, or cancelled, until further notice. Participants of these meetings will be informed directly about this decision.

All work-related travel for ECHA staff members is cancelled or postponed.

ECHA staff will be teleworking from Tuesday, 17 March 2020 to Tuesday, 21 April 2020.

Our goal is not to disrupt the Agency's crucial functions but non-critical activities might need to be re-prioritised. These measures are being reviewed constantly in light of new information.

Information for meeting participants

Committee members or external participants who have received a personal invitation to a meeting at ECHA will be entitled to reimbursement for any costs already incurred for travel and accommodation and should contact reimbursements@echa.europa.eu for these claims to be handled.

ECHA, 17 March 2020

<https://echa.europa.eu/events#safer-chemicals-conference-2020>

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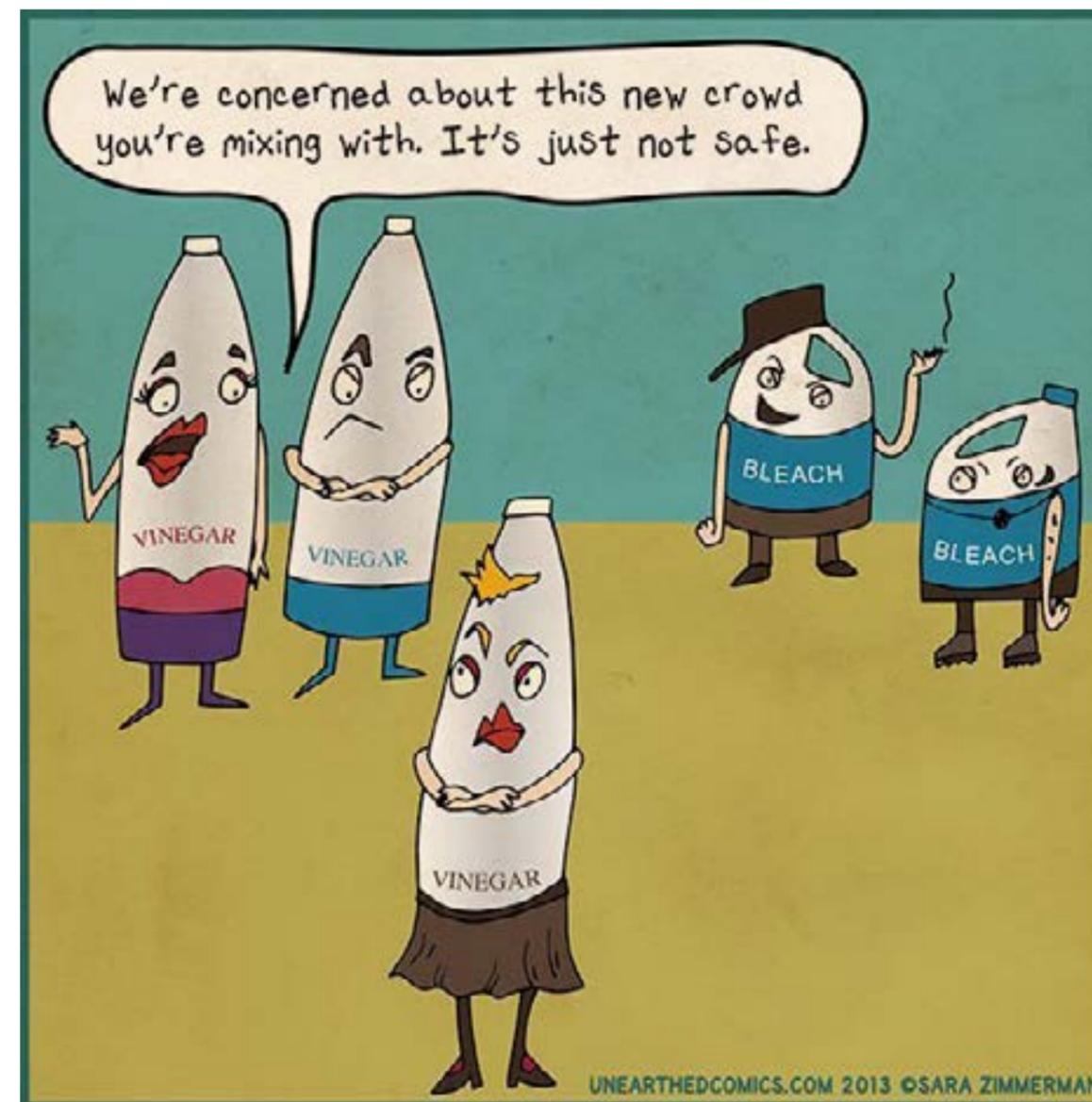
Janet's Corner

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Concerned with this new crowd

2020-03-24

The World Health Organisation (WHO) has declared the coronavirus outbreak a global pandemic.



<https://www.pinterest.com.au/pin/192317846565133472/>

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Hazard Alert

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Tartaric Acid

2020-03-17

Tartaric acid is a white crystalline dicarboxylic acid. It is the most water-soluble of the solid acidulants and is produced from potassium acid tartrate, which is a by-product of the wine industry from the press cakes, less and argols left behind. The acid is popular in major wine producing countries, including Spain, France, Germany and Italy. [1]

USES [1,2]

Tartaric acid is primarily used as an acidulant—additives that give a sharp (sour, tart or acidic) taste to foods. It is particularly effective in anything that is lime or grape flavoured, and as such, is often found in grape and lime flavoured beverages, gelatinous desserts, jams and hard boiled sweets. It is also used in baking in various applications, including as a leavening agent (when combined with baking soda), and to increase the stability of foods.

ROUTES OF EXPOSURE [2,3]

- People can be exposed to tartaric acid by inhalation, skin and eye contact and by ingesting the compound.
- Tartaric acid naturally occurs in fruit plants, including apples, bananas, apricots, avocados, grapes and tamarinds

~h1 Health Effects

Tartaric acid poisoning can affect a range of systems including the nervous, respiratory and cardiovascular systems.

Acute Effects [4]

Severity of symptoms depends on the level and type of exposure.

- In low doses, tartaric acid is an irritant.
- Skin contact can cause itching and a rash.
- Eye contact may result in lacrimation, redness and pain.
- Inhalation of the compound could result in coughing and irritation of the mucous membrane of the nasal passage.
- Due to the form of tartaric acid, high levels of ingestion are considered unlikely. However, if high levels are ingested, it may cause gastrointestinal (GI) irritation.

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Chronic Effects [5]

While chronic toxicity of tartaric acid is considered a low risk, it is still possible. Prolonged exposure to the compound can cause skin, upper respiratory tract and mucous membrane irritation. Ingestion of large quantities may result in irritation to the GI tract, which could result in nausea or vomiting.

SAFETY

First Aid Measures [3]

- Ingestion: If ingested, rinse mouth with water and DO NOT induce vomiting. Immediately call a doctor or a poison centre.
- Skin contact: In case of skin or hair contact, remove affected clothing and wash exposed skin with mild soap and water followed by a warm water rinse.
- Eye contact: Flush eyes out carefully with water for a few minutes. Remove contact lenses if easy to do so. Continue rinsing. Immediately call a poison centre.
- Inhaled: Take contaminated person to nearest fresh air source and monitor their breathing. Allow person to rest.

Exposure Controls/Personal Protection [3]

- Engineering controls: Safety showers and emergency eyewash fountains should be accessible in the immediate area of the potential exposure.
- Personal protection: Safety glasses and protective gloves.

REGULATION

United States [6]:

The Occupational Safety and Health Administration (OSHA) has set an 8-hour time-weighted average (TWA) concentration for tartaric acid of 15mg/m³.

Australia [7]

Safe Work Australia: Safe Work Australia has not set a specific TWA for tartaric acid. For dust limits that have not otherwise been specified, the TWA set for an 8-hour, 5-days-a-week is 10mg/m³. In industrial settings, it is recommended to keep exposure below the TWA levels. This can be

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done by using local exhaust ventilation or by capturing substances at the source.

~h1References

1. <https://www.sciencedirect.com/topics/immunology-and-microbiology/tartaric-acid>
2. <https://food.ndtv.com/ingredient/tartaric-acid-701185>
3. <http://www.labchem.com/tools/msds/msds/LC25940.pdf>
4. <https://www.tarac.com.au/assets/product-attachments/Tartaric-L+-Tartaric-Acid-Natural-Safety-Data-Sheet-June-2016.pdf>
5. <https://www.ams.usda.gov/sites/default/files/media/Tartaric%20acid%20report%202011%282%29.pdf>
6. <http://datasheets.scbt.com/sc-218622.pdf>
7. <https://www.chemsupply.com.au/documents/TA0101CH9T.pdf>

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Gossip

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Scientists plant 'sentinel trees' to warn of devastating pests

2020-03-25

It's become an all-too-common tale: An introduced insect takes hold in a new home and then spreads, wreaking havoc with ecosystems and economies. Take, for instance, the emerald ash borer, an Asian beetle first spotted in North America in 2002; researchers estimate it has killed hundreds of millions of ash trees and caused more than \$10 billion in damage.

Now, in a bid to prevent such catastrophes—and get an early warning of which exotic pests are likely to cause trouble—researchers from the United States, Europe, and China are trying a new approach: planting "sentinel trees" from their own regions in distant nations, and then observing which insects attack. The findings should help authorities more quickly recognize and snuff out threatening introduced insects if they show up in the trees' native countries. Sentinel trees are "the new frontier" in fighting forest pests, says entomologist Jiri Hulcr at the University of Florida.

Already, groves of North American and European trees planted in China have enabled scientists to identify and start to study more than a dozen insects of concern. In Europe, 23 nations have launched a €5 million project that will, among other activities, establish sentinel nurseries in North America, Asia, and South Africa—and enable researchers to plant trees from those areas in Europe. And next month, if the coronavirus pandemic doesn't interfere, researchers will plant the first sentinel grove of Asian trees in the United States.

A team led by entomologist Alain Roques of France's National Institute for Agriculture, Food, and Environment pioneered the approach between 2007 and 2011, when it planted seven tree species in Fuyang and near Beijing in China. By 2015, the researchers had identified more than 100 kinds of insects that had sampled the trees. They considered five species to be dangerous, and they took one—a bagworm moth—back to Europe to study its appetite for broadleaved trees. That study, conducted under quarantine, showed the moth can destroy numerous trees, Roques reported in January at a U.S. Department of Agriculture conference in Annapolis, Maryland.

Hulcr became a convert after colleagues in China discovered a beetle demolishing American sweetgum trees that had been planted near

Already, groves of North American and European trees planted in China have enabled scientists to identify and start to study more than a dozen insects of concern.

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Shanghai. Sweetgum is an ecologically and economically important species in the southeastern United States. If the beetle, which he and his colleagues named the sweetgum inscriber, gained a foothold in North America, it could pose a serious threat, they reported in 2017.

The discovery prompted China to ban imports of the tree, to avoid further damage. And it spurred Hulcr in 2018 to plant his first sentinel grove of North American trees in China's Fujian province. Hulcr and colleagues in China has since established two additional plantations, which hold pines, oaks, and citrus trees, in Yunnan and Shandong provinces, and plans a fourth in Liaoning province.

So far, Hulcr's team has detected eight insect species of concern, which the researchers are now rearing and studying. Such studies could alert authorities to look for the pests, some of which were unknown to science, and lead to better monitoring traps and control measures.

Establishing sentinel orchards in a foreign nation can be fraught, Roques says. A Chinese farmer destroyed one of his plantings after seeing insect damage, not realizing the attacks were by design. He lost access to other potential sites after collaborators balked, fearing his trees would also bring European pests to Asia.

Funding agencies are ramping up support for sentinel groves. Europe's new project, called Holistic Management of Emerging Forest Pests and Diseases, is expected to run through 2024. And the U.S. Forest Service (USFS) is funding several projects, including one led by Ohio State University, Columbus, plant pathologist Enrico Bonello that, in April, is scheduled to plant the first sentinel trees from Asia and Europe—including beeches, hollies, maples, and pines—in Ohio and New Hampshire. Collaborators have already planted North American and Asian trees in Sweden and Italy.

It could take years to know whether the sentinels provide useful intelligence. Some insects won't attack young trees, for instance, so researchers will have to wait to see what the mature trees attract. And some trees become stressed and more vulnerable to insects when growing outside their native range, potentially making observations less relevant to predicting the impacts of invasions.

Governments, meanwhile, are still figuring out how they might incorporate any findings into biosecurity policies and practical actions. "Science and regulation are disjoint a lot of times," Roques says. But Elizabeth Lebow, who directs invasive species programs for USFS's

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international office, believes new sentinel trees are "a really smart approach ... [to] informing our early detection efforts."

sciencemag.org, 25 March 2020

<https://www.sciencemag.org>

Can a century-old TB vaccine steel the immune system against the new coronavirus?

2020-03-23

Researchers in four countries will soon start a clinical trial of an unorthodox approach to the new coronavirus. They will test whether a century-old vaccine against tuberculosis (TB), a bacterial disease, can rev up the human immune system in a broad way, allowing it to better fight the virus that causes coronavirus disease 2019 and, perhaps, prevent infection with it altogether. The studies will be done in physicians and nurses, who are at higher risk of becoming infected with the respiratory disease than the general population, and in the elderly, who are at higher risk of serious illness if they become infected.

A team in the Netherlands will kick off the first of the trials this week. They will recruit 1000 health care workers in eight Dutch hospitals who will either receive the vaccine, called bacillus Calmette-Guérin (BCG), or a placebo.

BCG contains a live, weakened strain of *Mycobacterium bovis*, a cousin of *M. tuberculosis*, the microbe that causes TB. (The vaccine is named after French microbiologists Albert Calmette and Camille Guérin, who developed it in the early 20th century.) The vaccine is given to children in their first year of life in most countries of the world, and is safe and cheap—but far from perfect: It prevents about 60% of TB cases in children on average, with large differences between countries.

Since then, the clinical evidence has strengthened and several groups have made important steps investigating how BCG may generally boost the immune system. Mihai Netea, an infectious disease specialist at Radboud University Medical Center, discovered that the vaccine may defy textbook knowledge of how immunity works.

When a pathogen enters the body, white blood cells of the "innate" arm of the immune system attack it first; they may handle up to 99% of infections. If these cells fail, they call in the "adaptive" immune system, and T cells and antibody-producing B cells start to divide to join the fight. Key to

They will recruit 1000 health care workers in eight Dutch hospitals who will either receive the vaccine, called bacillus Calmette-Guérin (BCG), or a placebo.

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this is that certain T cells or antibodies are specific to the pathogen; their presence is amplified the most. Once the pathogen is eliminated, a small portion of these pathogen-specific cells transform into memory cells that speed up T cell and B cell production the next time the same pathogen attacks. Vaccines are based on this mechanism of immunity.

The innate immune system, composed of white blood cells such as macrophages, natural killer cells, and neutrophils, was supposed to have no such memory. But Netea's team discovered that BCG, which can remain alive in the human skin for up to several months, triggers not only *Mycobacterium*-specific memory B and T cells, but also stimulates the innate blood cells for a prolonged period. "Trained immunity," **Netea and colleagues call it**. In a **randomized placebo-controlled study** published in 2018, the team showed that BCG vaccination protects against experimental infection with a weakened form of the yellow fever virus, which is used as a vaccine.

Together with Evangelos Giamarellos from the University of Athens, Netea has set up a study in Greece to see whether BCG can increase resistance to infections overall in elderly people. He is planning to start a similar study in the Netherlands soon. The trial was designed before the new coronavirus emerged, but the pandemic may reveal BCG's broad effects more clearly, Netea says.

For the health care worker study, Netea teamed up with epidemiologist and microbiologist Marc Bonten of UMC Utrecht. "There is a lot of enthusiasm to participate," among the workers, Bonten says. The team decided not to use actual infection with coronavirus as the study outcome, but "unplanned absenteeism." "We don't have a large budget and it won't be feasible to visit the sick professionals at home," Bonten says. Looking at absenteeism has the advantage that any beneficial effects of the BCG vaccine on influenza and other infections may be captured as well, he says.

Although the study is randomized, participants will likely know if they got the vaccine instead of a placebo. BCG often causes a pustule at the injection site that may persist for months, usually resulting in a scar. But the researchers will be blinded to which arm of the study—vaccine or placebo—a person is in.

A research group at the University of Melbourne is setting up a BCG study among health care workers using the exact same protocol. Another research group at the University of Exeter will do a similar study in the elderly. And a team at the Max Planck Institute for Infection Biology last week announced that—inspired by Netea's work—it will embark

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on **a similar trial** in elderly people and health workers with VPM1002, a genetically modified version of BCG that has not yet been approved for use against TB.

Eleanor Fish, an immunologist at the University of Toronto, says the vaccine probably won't eliminate infections with the new coronavirus completely, but is likely to dampen its impact on individuals. Fish says she'd take the vaccine herself if she could get a hold of it, and even wonders whether it's ethical to withhold its potential benefits from trial subjects in the placebo arm.

But Netea says the randomized design is critical: "Otherwise we would never know if this is good for people." The team may have answers within a few months.

[sciencemag.org](https://www.sciencemag.org), 23 March 2020

<https://www.sciencemag.org>

Here are the 'dirty dozen' fruit and vegetable laced with legal pesticides—even organics have traces

2020-03-25

Nearly 70% of the fresh produce sold in the U.S. contains residues of legal though potentially harmful chemical pesticides even in small amounts, and a popular snack for children is another big offender.

Among the top choices to limit exposure to pesticides? Avocados, asparagus and honeydew melon.

The analysis comes from the Environmental Working Group. Each year since 2004 it has ranked its Dirty Dozen and Clean Fifteen lists and combines them as a shopper's guide for consumers. The "dirtiest" of all is not a fresh fruit or vegetable, but a dried one — raisins. Raisins weren't ranked on the fresh lists but their surprising results caught the attention of EWG.

Toxicologists and other researchers at EWG compare the pesticide contamination of 47 popular conventional — meaning not farmed organically — fruits and vegetables. The review is based on the results of tests by the USDA and the Food and Drug Administration of more than 43,000 samples of produce.

Most pesticide residues the agency finds fall within government-mandated restrictions, but advocacy groups such as EWG argue "legal

Among the top choices to limit exposure to pesticides? Avocados, asparagus and honeydew melon.

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does not mean safe." Before conducting its tests, USDA washes, scrubs and peels fruits and vegetables as consumers would.

Thomas Galligan, Ph.D, a toxicologist with EWG said researchers continue to study why raisins contained higher traces of pesticides than the grapes they're dried from, though grapes ranked on the list this year. [Read more of his analysis.](#)

Children under the age of 15 eat a total of about 208 million pounds of raisins each year, or about half of the raisins consumed in the U.S., according to Zion Market Research. The average American consumed about 1.25 pounds of raisins in 2017, the latest year for which the USDA has information. Zion's industry analysis shows that slightly less than two-thirds of raisins are consumed as ingredients in other foods, with the rest eaten as a stand-alone snack.

"Infants, babies and young children are exquisitely vulnerable to even low levels of pesticide exposure, so it's important parents and caregivers take steps to safeguard children from these chemicals while also providing them diets rich in healthy fruits and vegetables," said Dr. Philip Landrigan, a pediatrician and epidemiologist who's director of the Program in Global Public Health and the Common Good in the Schiller Institute for Integrated Science and Society at Boston College.

"For many Americans, choosing an all-organic diet is not possible, so [pesticide guides] can help give consumers the tools to provide their families with a mix of both conventional and organic fruits and veggies without the pesticide punch," he said.

Producers generally use pesticides to improve crop yield, which can hold down retail prices, which is particularly important to low-income consumers. The findings also show that even produce labeled organic can show traces of pesticide.

The EWG group highlighted two chemicals in particular. One is neurotoxic insecticide chlorpyrifos, which some research has shown can harm the brain and nervous system in children at even low levels. The chemical was detected on 5%, or 34 out of 670 samples, of conventional raisins, and 6%, or five out of 86, of organic raisin samples.

California, where the majority of the U.S. raisin supply is produced, recently banned all uses of chlorpyrifos because of the risks it poses to both children and farm workers. That regulatory change was not carried through to the federal level, however.

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The second chemical of note is neonicotinoids, which the USDA's tests detected on almost one-fifth of fruits and vegetables. Neonics are the fastest growing class of insecticides, "despite a decade of research making it clear that they are highly toxic to honeybees and other pollinator species," EWG researchers said. Some studies on human health also suggest that exposure to neonics may be harmful to the developing fetus and children, they said.

Residues of at least one of three neonicotinoid pesticides banned in the European Union — imidacloprid, clothianidin and thiamethoxam — were found on more than half the U.S. samples of potatoes, spinach and lettuce tested. At least one of these neonics was also found on more than one-fourth of the samples of U.S. cherries, watermelon and strawberries.

The Alliance for Food and Farming, which represents both organic and conventional farmers of fruits and vegetables, argues that these annual lists overstate the amount of pesticide detection on food.

"To accurately assess consumer risks from pesticides, one needs to consider three major factors – 1) the amount of residue on the foods, 2) the amount of food consumed, and 3) the toxicity of the pesticides," said Dr. Carl Winter, professor emeritus in toxicology at the University of California, Davis.

AFF points to an analysis and a calculator from toxicologists with the University of California's Personal Chemical Exposure Program, which found a child could eat hundreds to thousands of servings of a fruit or vegetable in a day [and still not have any health effects from residues.](#)

Experts at EWG and the AFF stressed that maintaining fruits and vegetables in daily diets is the most important goal. Sometimes budget and availability limit shopping for organic produce.

"Although we believe consumers should be concerned about pesticide residues on the food they eat, the health benefits of a diet rich in fruits and vegetables outweigh the risks of pesticide exposure," said Alexis Temkin, PhD, a toxicologist with EWG. "With the Shopper's Guide, consumers don't have to choose between pesticides and a healthy diet."

EWG added specific guidance to its report as consumers [respond to the coronavirus pandemic.](#)

It is important to know that there is no evidence people can be exposed to the coronavirus through food, experts say. The spread pattern is quite different from foodborne pathogens like Salmonella and E.coli. That is why,

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even though the risks of COVID-19 are serious, consumers should continue eating plenty of healthy fruits and vegetables while in quarantine at home, the group said.

marketwatch.com, 25 March 2020

<https://www.marketwatch.com>

This Brutal Pesticide Creates a 'Circle Death.' So Why Is It Making a Comeback?

2020-03-01

The victim lying on Kevin Hynes's stainless-steel table on March 11, 2015, showed no obvious cause of death. There were no injuries indicating that she had been hit by a car or electrocuted—the usual killers. Dressed in surgical scrubs and latex gloves, Hynes, a wildlife biologist with the New York Department of Environmental Conservation in Delmar, peered through the magnifying visor affixed to his headband and examined the Bald Eagle more closely.

She was a female, seemingly in good health, and likely a mother incubating eggs, indicated by the bare skin—a brood patch—on her underbelly. Her stomach contents showed that she had been fit enough to find a rabbit earlier that day. Scraps of sheep hair and skin at the back of her mouth provided a clue that a more recent meal had been cut short. Maybe she'd been poisoned, Hynes thought. He ordered a toxicology screening.

A couple of weeks later, the results revealed the culprit: carbofuran, a neurotoxic chemical that is one of history's deadliest pesticides. A quarter teaspoon can kill a 400-pound bear in minutes. It's especially lethal for birds. Whereas the pesticide DDT, banned in the 1970s after driving Bald Eagles, Peregrine Falcons, and Brown Pelicans to near extinction, works its way up the food chain gradually, like a progressive disease, carbofuran's effect is instantaneous. "It interferes with the enzymes that help nerves talk to each other," says Ngaio Richards, a Montana-based wildlife biologist with an expertise in forensic science, who wrote a book documenting global animal poisonings from carbofuran. "When an animal is exposed, it goes into convulsions and respiratory failure. It's an excruciating death."

Carbofuran was pulled from the U.S. market in 2009, but it didn't disappear. People here and elsewhere—including in many countries where it's still sold legally—use it to kill animals, rather than the insects it was invented to target. In Europe, gamekeepers defending pheasants

A quarter teaspoon can kill a 400-pound bear in minutes.

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at grouse-hunting estates poisoned hundreds of birds of prey, including Red Kites, Golden and White-tailed Eagles, and goshawks. Nearly 190 vultures in Kenya died after dining on the remains of an animal laced with carbofuran; a scientist studying the birds watched in horror as they dropped out of the sky within minutes of their meal. More than 230 Tundra Swan carcasses constituted a carbofuran crime scene at a lake in Inner Mongolia (authorities suspect poachers aimed to sell the birds to restaurants, some of which offer "swan feasts").

Eagles have been an especially common target in the United States. Last May wildlife investigators offered a \$10,000 reward for information related to a spree of carbofuran poisonings on Maryland's Eastern Shore that had wiped out six Bald Eagles and a Great Horned Owl. A similar unsolved case three years ago left 13 eagles dead.

"Everyone knows this stuff works very, very well for killing animals," says Mourad Gabriel, a research associate at the University of California One Health Institute in Davis and co-director of the Integral Ecology Research Center. In some parts of California, where Gabriel works, growers at illegal marijuana farms on public lands have been using carbofuran to protect their camps from bears and other wildlife. As a result, scientists there are finding entire food webs, from pollinators and rodents to raptors and coyotes, decimated by the pesticide.

And so, even as it has become more difficult to acquire, carbofuran's popularity has grown. The once-mass-market pesticide has become a go-to poison for an active underground—and left wildlife officials grappling with the consequences.

For more than 40 years, carbofuran's deadly nature has been its selling point. A 1980s TV commercial features a flannel-clad farmer in a flatbed pickup loaded with bags of the Pepto-Bismol-colored granules. "You're a Furadan man because you know what's best," goes the bouncy jingle. "Cuz it saves more corn cuz it stops more pests." Introduced with the U.S. trade name Furadan in 1967, carbofuran offered farmers the tantalizing prospect of greater crop yields. A broad-spectrum insecticide, it could wipe out insects, mites, and nematodes plaguing fields of corn, soybeans, alfalfa, and potatoes.

The chemical was an immediate and unequivocal success. Within a decade, domestic sales had soared to \$100 million. In 1980 the Food Machinery and Chemical (later renamed FMC) Corporation, which patented Furadan, introduced carbofuran to European and Asian markets under the name Marshal. When FMC's patent expired six years later, other

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companies started making and distributing carbofuran under different trade names, including Yaltox, Carbodan, Carbosip, Chinufur, Kenofuran, and Niagara.

Meanwhile, authorities had wisened to the fact that Furadan kills not just insects. Studies in the 1990s showed a single granule, resembling a natural seed grain in size and shape, could kill a small bird, according to Environmental Protection Agency scientists. In fact, the EPA reported that the insecticide was wiping out one to two million birds in the United States each year—more than any other pesticide in legal use, according to American Bird Conservancy scientists. The agency initiated a nationwide ban on the granular form of Furadan in 1991; liquid Furadan, considered less dangerous to birds, remained on the market. But then in 2006 it recommended restricting all uses due to grave concerns about the risks to ecosystems, drinking water and food, and the farm workers who handled it. The EPA announced a year later that it intended to prohibit liquid Furadan and block imports of any produce containing carbofuran residues.

At first FMC fought the decision in court. But in 2008 the company withdrew Furadan from U.S. markets and recalled products from stores, a step heralded as a win for the environment. Some observe, however, that FMC may have simply been executing a strategy commonly used by chemical companies. Preemptively withdrawing a pesticide creates a loophole to bring it back, says Drew Toher, community resource and policy director with the nonprofit Beyond Pesticides. He points to the example of aldicarb, trade name Temik, considered an “extremely hazardous substance” by the EPA. Facing a likely ban, Temik maker Bayer CropScience withdrew it from U.S. markets in 2010. Six years later, the EPA under the Trump administration began permitting farmers cultivating such crops as cotton, soybeans, and potatoes to once again use the chemical under a new trade name, AgLogic 15G. “When we have an EPA that’s more malleable to industry interests,” Toher says, “these half measures come back to bite us.”

And although Furadan left U.S. markets, FMC continued manufacturing and shipping carbofuran formulations for sale in other countries, including granular Furadan for use on rice fields in Asia. (U.S. laws do not prohibit chemical makers from exporting domestically banned pesticides.) It did so right up through December 2019, when *Audubon* contacted the company for this story. FMC spokesperson Emily Parenteau wrote that, as of January 1, 2020, FMC would no longer sell carbofuran products globally. Even so, she maintained, carbofuran does not harm humans or wildlife if used in accordance with label instructions.

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Biologists refute that claim. “This product is inherently toxic. You can’t make it safe,” says Richards. And as long as people still have access to the chemical, they will continue using it to poison wildlife. Carbofuran’s reach is long and far, she says, and people who poison wildlife can be ruthless.

Special agent Ken Dulik has witnessed so many carbofuran poisonings in his 30-plus years with the U.S. Fish and Wildlife Service that he can spot an eagle killed by the chemical. “When they go into convulsions, their tail and wings spread out and their head arches over the neck backwards,” he says. “It’s a fast and brutal death. Once you’ve seen it, you know what it is.”

In addition to the telltale appearance of a poisoned bird, carbofuran creates what’s often called “a circle of death,” detectable for miles. For example: A coyote feeds on a poisoned cow carcass, walks 100 yards away, and dies. Then another coyote feeds on that one. Because it received a lower dose, it might travel 400 or 600 yards before succumbing. A bird that feeds on the second victim might manage to fly a half mile. “The circle of death keeps moving outward,” Dulik says. “In one case, we had a four-square-mile radius that we kept finding animals in. Each time you find a carcass, your crime scene gets bigger and bigger. I’m never confident that we’ve found them all.”

In the United States, it doesn’t matter that carbofuran is no longer sold in stores; it’s common for farmers to have some of the banned chemical stashed away. “Plenty of people have kept a jar from back in the day,” Dulik says. “There’s no other purpose than for killing animals.” Doing so can carry a stiff penalty. People who violate wildlife laws such as the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act can face serious criminal charges and fines. In extreme cases, even jail time.

The Bald Eagle on Kevin Hynes’s examination table back in 2015 had been discovered four days earlier in a cornfield in the small town of Addison in New York’s Southern Tier. After retrieving the carcass, Steven Farrand, an officer with the New York State Department of Environmental Conservation, learned that a sheep farmer had reported losing animals to eagles and allegedly talked about shooting the birds. The farmer, William Wentling, lived about 200 miles south in Lancaster County, Pennsylvania, and paid a local named Eli Byler to periodically check on his sheep outside of Addison. For his part, Byler claimed not to know anything about a dead eagle.

Two weeks later, Farrand got a call from a man who came across two dead hawks while hunting coyotes on Wentling’s farm. Farrand collected the birds, a partial Rough-legged Hawk and a Red-tailed Hawk, plus

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another eagle, lying next to dead sheep and sent them to Hynes. He soon confirmed that they, too, had died from ingesting carbofuran.

With a warrant to search the property, Farrand found another Red-tailed Hawk adjacent to the sheep pile, a plastic bottle, and four discarded black latex gloves. All tested positive for carbofuran. With the evidence mounting, federal wildlife authorities joined the investigation. Another search revealed more black latex gloves.

Then they searched Byler's property. "The smoking gun," says FWS senior special agent Lee Schneckenberger, "was the huge jug of carbofuran hidden behind the toilet in the barn." Someone had written the word "Poison" and drawn a skull and crossbones on the bottle.

Confronted with this discovery, Byler confessed, but said he had simply been following Wentling's instructions. He then agreed to call Wentling and allow the agents to secretly record the phone call. "Byler told Wentling he was very nervous and that he could not continue to lie about the poison," Schneckenberger says, quoting from the tape recordings. "Wentling responded, 'I don't want you to lie, but if you let the cat out of the bag, we're all going to hang.'"

In Wentling's version of the story, he was innocent; Byler was the real criminal. "The man looking after the sheep told me that eagles were killing the lambs as they were being born," Wentling told me over the phone. "I said, 'We've got to get rid of them, but I don't know how.' I had corn insecticide on the shelf that I'd bought 8 or 10 years ago at a public sale. He poured that insecticide on the sheep—I didn't know anything about it."

Nonetheless, in June 2017, Wentling pleaded guilty to misdemeanor violations of the Bald and Golden Eagle Protection Act. Taking into account that he had no prior criminal history, the federal judge sentenced him to two years of probation and a \$3,500 fine. Eli Byler and his son, who assisted him with the poisoning, were not prosecuted at the federal level; in New York, they pleaded guilty to reduced charges and were each sentenced to one year of probation and a \$75 fine.

From Dulik's perspective, every conviction is a helpful deterrent to other would-be poisoners. It sends a message, he says: "It's not worth it." Thus in rural areas, wildlife agents continue to methodically track down rogue farmers and ranchers who use the chemical to protect their livestock. In Northern California, meanwhile, authorities are facing an even more intractable problem: illicit pot growers toting semi-automatic rifles, operating in the remote wilderness.

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In California's Emerald Triangle, the three-county epicenter of pot cultivation in the United States, an estimated 50,000 legal farms work to fill the commercial demand for cannabis, now permitted for recreational use in 11 states and for medical purposes in 33. On nearby public lands, drug cartels operate hundreds of thousands more plots that supply a black market. In 2019 alone, authorities in California removed more than 950,000 pot plants from 345 illegal sites. Called "trespass grows," such sites are often difficult to find because they're concealed within rugged old-growth forests, home to Spotted Owls, cougars, bears, and house-cat-size carnivores called Pacific fishers.

A fisher provided the first clue to the extent to which carbofuran and other pesticides are damaging the ecosystem in Northern California, where the animal's population may have dwindled to several hundred individuals. In 2009, Gabriel, of the Integral Ecology Research Center, necropsied a seemingly healthy-looking Pacific fisher whose body cavity was filled with blood from internal hemorrhaging. Cause of death: anticoagulant rodenticide, more commonly known as rat poison.

Baffled as to where the animal might have encountered rat poison so far from human development, Gabriel reexamined 58 carcasses he'd recovered in the past three years. More than 80 percent contained at least one type of rodenticide. When he reported this result at a wildlife conference in 2010, a pair of conservation officers approached him with a possible insight: They were frequently finding various chemicals on their raids of illegal marijuana grow sites.

Wanting to see the sites for himself, Gabriel accompanied an armed officer and two other researchers to a location known as Mill Creek on the Hoopa Valley Reservation. Winding along the banks of a salmon stream—deep in a gorge where Gabriel had once radio-collared gray foxes—they came upon a denuded patch of forest where 130-year-old tanoaks once stood. The growers had felled the trees and planted thousands of pot plants up to the creek's edge. Now that police had confiscated the marijuana, all that was left was barren land littered with irrigation lines and refuse. The group found food, sleeping bags, tents, sprayers, trash pits, and stashes of toxicants—including rat poison and a bottle of carbofuran.

"It was a witches' brew," Gabriel says. "We were like, 'Wow, this isn't some little foray,' like back in the day when a guy would hike down the trail, water his plants, and leave. People were living down here. Then we walked another trail and found another plot, and another. We didn't even cover half of it all that day. There are hundreds of these sites."

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To document the problem, Gabriel and his colleagues now work side by side with officers as they raid plots guarded by armed growers. The scientists dress in camouflage and wear face paint; Gabriel carries a gun. "This isn't bravado," he says. "We want to go home at the end of the day."

Often the teams encounter Gatorade bottles filled with carbofuran and tuna tins stuffed with carbofuran-tainted meat. The labels on jugs of chemical are frequently in Spanish, indicating they were smuggled from Mexico. Gabriel questions the growers on site, after they've been arrested, and some have admitted to using carbofuran to keep animals from rampaging their camps because, they say, it worked great for getting rid of jaguars preying on livestock back home in Mexico.

The scientists' bold field work is paying off, if only to document a compounding problem. In 2013 they discovered carbofuran at 20 percent of the raided sites. Just six years later it's been found at more than 80 percent of them. Gabriel suspects the growers are increasingly using carbofuran not just because of its potency with animals, but also with law enforcement: Media outlets have reported officers exposed to the chemical being hospitalized for nausea, blurry vision, and migraines.

Sheriff's sergeant Nathan Trujillo, a member of the Trinity County Crimes Unit who has been working with Gabriel's team for about seven years, has had some close calls on the raids. In 2015, for instance, he and his K9 Johnny were going into an area where a forester had reported an illegal grow site. "We kept seeing pink tuna cans along the trail," he says. "In the camp, we found a bottle of carbofuran, open and empty." After splashing through some water, Johnny seized up, started foaming at the mouth, and then vomiting. Trujillo rushed the dog to the vet. "I don't know how they saved him, but they did," he says. "You used to worry about getting shot or breaking a leg in a canyon. Now you have to worry about this almost invisible weapon these guys have."

As the surge of pesticides in state forests continues to course through the ecosystem, water supplies, and even some marijuana smoked by consumers, government agencies and Gabriel's organization are working to mitigate the contamination. But resources are limited, and the process is slow in remote backcountry that often requires helicopter access. Of 1,000 sites discovered so far, Gabriel and his team have cleaned fewer than 200.

"It's going to take a collective of scientists and a lot more funding and logistics to address this," Gabriel says. "We can't leave these sites with

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chemicals in plastic bottles. If that bottle opens up 20 years from now, boom, you have another pulse of contamination."

At press time the Mexican government was reportedly planning a ban on imports of carbofuran, which may help stem the tide of the chemical's damage in California forests, says Gabriel. If it does, it would join the 63 countries (out of the 150 that report such information) that have already taken that step. Meanwhile, dozens of companies continue to make and sell carbofuran around the globe—including some, like FMC until it stopped exports this year, headquartered in nations where the pesticide can no longer be legally used.

Science doesn't justify its sale at all. From Africa and Asia to Europe and North and South America, a global collective of biologists documenting animals killed by carbofuran say the sole condition under which it can be safely used—in accordance with label directions—is "if an area is completely devoid of wildlife." As each successive poisoning illustrates, carbofuran may instead help create this circumstance. Even decades after environmental officials found the pesticide imperils people and birds, carbofuran's toxic legacy, and its circle of death, still grows.

audubon.org, 1 March 2020

<https://www.audubon.org>

In race for a sustainable alternative to plastic, Indonesia bets on seaweed

2020-03-25

BALI, Indonesia — It's just after sunrise here in Bali, and a group of locals are preparing to sail their wooden boats out to a bay off Nusa Lembongan, a small island southeast of the tourism hotspot.

They're neither fishermen nor tour guides. They're farmers, cultivating a watery crop that promises to be part of the solution to the increasingly urgent problem of marine plastic waste that's become woven into the Bali experience for the millions of people who visit the island each year.

"Algae cover a very broad area," says Rama. "I am optimistic. We can develop ecotourism and use the algae in many ways — for example in our spa, where we scrub tourists with seaweed."

Rama, 17, is part of a new generation of Balinese hoping to carry on an age-old tradition of harvesting algae, or seaweed. He looks out at the calm and still waters of Lembongan Bay. The inlet is protected by reefs

It's the perfect place for what grows beneath the surface: *Eucheuma cottonii*, also known as macroalgae or red seaweed.

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that absorb the waves some 100 meters (330 feet) off the shore. The water temperature hovers at 28° Celsius (82° Fahrenheit), salinity is at 30%, and the current flows in just the right direction. It's the perfect place for what grows beneath the surface: *Eucheuma cottonii*, also known as macroalgae or red seaweed. (Despite its name, it comes in shades of red, brown and green.) The seaweed grows in straight lines, attached to ropes stretched between iron rods that run over the sandy bottom.

Rama's father, Wayan Suarbawa, is one of Nusa Lembongan's five seaweed farmers — the last remnants of an industry that employed most of the island's 5,000 inhabitants during its heyday in the 1980s. The big blow came in 2014-2016, when the farms were hit by a bacterial infestation that hardened and whitened the seaweed. The disease was triggered by a rise in water temperature and changes in salinity and light conditions — the hallmarks of a changing climate. With their livelihoods devastated, most of the farmers sought out jobs in the tourism industry.

Indonesia was the world leader in the production of *E. cottonii* before 2014, churning out more than 8 million tons a year. Today it's No. 2, after China, but still supplies 38% of the global seaweed market.

But the tide is turning once again in Nusa Lembongan. The local government wants to employ an additional 100 seaweed farmers in Lembongan Bay through a program that hands out 0.8 hectares (2 acres) per farmer to grow seaweed. The waters around Nusa Lembongan could potentially host up to 500 seaweed farmers. Prices are up, along with prospects for *Eucheuma* seaweed, which is used to make carrageenan, a thickener and stabilizer used in foods, cosmetics and industrial products. In countries like Indonesia and the Philippines, the macroalgae is also consumed as food.

Suarbawa says he makes about 15 million rupiah (about \$1,000) a month — six times the minimum wage in Bali — just from selling seaweed to visitors coming from the capital, Jakarta. Suarbawa is also involved in plans for an ecotourism initiative in Nusa Lembongan that will bring tourists to snorkel among the algae.

But the threat of climate change and the potential for another bacterial outbreak still linger over Lembongan Bay. This part of Bali has also lost a number of seaweed farms to tourism developments, clearing of wetlands, and pollution. To ensure a more resilient seaweed-farming industry this time around, the farmers will have to develop more resistant varieties of algae, experts say.

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"Climate change and the accompanying El Niño will significantly destroy seaweed farming in Indonesia," says Ketut Sudiarta, a scientist in the fisheries department at Bali's Warmadewa University. "This has happened now. Almost all of Indonesia has failed and most of [the farms] have been abandoned by farmers."

But if the industry succeeds, it could become a weapon in the fight against climate change. The algae grow quickly — 30 to 60 times faster than land-based plants — and absorb carbon dioxide from the water and atmosphere. If cultivated at scale, that makes it an important carbon sink, which can then be harvested and used as a biofuel in place of fossil fuels.

It could also be the solution to that other environmental bane in Bali: plastic waste, of which Indonesia is the world's second-biggest contributor, after China. Seaweed can be processed to make food containers — biodegradable, edible even — that could replace the conventional single-use plastic containers that account for much of the trash fouling Bali's beaches and seas.

According to Sudiarta, "it's very possible, especially for the big brands," to make the switch from plastic containers to seaweed-based packaging. For now, though, a host of small companies are pioneering that effort.

'Seaweed over plastic'

David Christian started his company, Evoware, in 2016, in response to the plastic waste crisis in his hometown of Jakarta. He makes edible seaweed cups under the Ello Jello brand that come in various colors and flavors, from orange to green tea. The company also produces edible food wrapping and single-use sachets, typically used for instant coffee or food condiments.

At a restaurant in central Jakarta that serves ice cream in Evoware cups, Christian explains how his initiative is more than just a corporate venture.

"We want to support the farmers in making a living from a sustainable source," he says, dressed in a T-shirt with the slogan "Seaweed over plastic."

"Seaweed does not take up land, it doesn't lead to deforestation, and no fertilizers are used," he adds.

Christian is involved in a 4Rs campaign — reduce, reuse, recycle, replace — that aims to reach a million people with its sustainable goals. Evoware's social involvement sees youths at orphanages in Jakarta, Bali and Malaysia produce and sell Ello Jello cups and keep the profit. Production is limited

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at present, about 500 per day, and testing is still going on. But orders have come from 900 companies in 52 countries, and Christian says full-scale industrial production of containers and cups should happen later this year.

“The demand for these products will only increase, and the cost of production will decrease,” he says, adding that reactions have been positive and that he welcomes other companies exploring similar solutions.

“We all have the same goal of beating the conventional plastics,” Christian says. “The market is enormous and we need many players, so why compete with one another?”

Future of bioplastics

One such company is Avani Eco, based in Bali and producing shopping bags (printed with “I am not plastic”) from cassava fiber since 2014. It also makes drinking straws from paper and cornstarch, as well as food boxes from bagasse, the dry, fibrous residue from sugarcane processing. The company garnered widespread attention when co-founder Kevin Kumala dissolved one of his bags in lukewarm water and drank it, to emphasize that it was non-toxic and entirely biodegradable.

While new technological advances have blown the field of bioplastics wide open, seaweed holds the most promise due to its versatility and the sheer scale of current production. The global seaweed market was valued at more than \$4 billion in 2017 and is estimated to pass \$9 billion by 2024, about 90% of it *E. cottonii*. Food production is still the main destination for the crop, and expected to keep growing, but alternative uses are being explored. These include seaweed as biomass for fuel, as well as for use in fertilizers, animal feed, and wastewater treatment.

Back in Nusa Lembongan, seaweed is being put in service to the area’s predominant industry: tourism. Komang Astawa, 33, is one of the island’s three newly trained seaweed farmers, the recipient of a 2-acre patch in the bay with 400 lines of seaweed. He plans this year to start taking tourists on snorkeling trips on his seaweed farm.

“I want to show tourists how we grow the seaweed, and how we harvest it,” Astawa says. “Seaweed is a big business. There are many ways to make money in it.”

news.mongabay.com, 25 March 2020

<https://www.news.mongabay.com>

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Shrinking Ozone Hole, Climate Change Are Causing Atmosphere “Tug of War”

2020-03-26

The notorious Antarctic “ozone hole” sparked worldwide concern after its discovery in the 1980s, and for good reason — declining ozone allows harmful ultraviolet radiation to reach the Earth’s surface, a major threat to public health.

But the ozone hole had another effect on the planet: It caused major atmospheric changes in the Southern Hemisphere.

With less ozone trapping solar radiation higher in the atmosphere, the stratosphere began to cool. The jet stream shifted toward the South Pole. The warm, wet tropics expanded, and the dry zone below the tropics shifted southward, as well. Weather patterns in certain parts of the Southern Hemisphere began to change.

Thanks to the Montreal Protocol, an international agreement to phase out ozone-depleting chlorofluorocarbons, the ozone hole is now in recovery. The treaty has been regarded as one of the most successful cooperative environmental efforts in history.

As it turns out, it’s had a noticeable effect on the Southern Hemisphere’s atmosphere. Since about the year 2000, there’s been a pause in the shifting of the jet stream and the other changes caused by the declining ozone.

These are the findings in a study published yesterday in *Nature*.

Led by Antara Banerjee of NOAA’s Earth System Research Laboratory, the researchers analyzed historical data from the Southern Hemisphere and revealed that past trends in the shifting atmosphere had been on hold for two decades. Then they used climate models to test whether the pause is the result of the recovering ozone layer or some other factor, like greenhouse gas emissions or natural climate cycles.

The study indicates that changes in the ozone layer are the primary driver.

At the same time, the models do suggest that greenhouse gas emissions and declining ozone have similar effects on the Southern Hemisphere’s atmosphere. The exact mechanisms are a little different, but climate change seems to encourage a poleward shift of the jet stream and an expansion of the tropics.

But the ozone hole had another effect on the planet: It caused major atmospheric changes in the Southern Hemisphere.

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Before the Montreal Protocol kicked in, it seems likely that greenhouse gas emissions were slightly reinforcing the effects of the ozone hole.

Greenhouse gases may also be part of the reason the trends have only paused since 2000, instead of being fully reversed. The effects of human-caused climate change are now somewhat at odds with the effects of the recovering ozone hole.

scientificamerican.com, 26 March 2020

<https://www.scientificamerica.com>

What we know about ACE inhibitors, high blood pressure and COVID-19

2020-03-25

The COVID-19 pandemic has unsurprisingly been associated with a similar epidemic of social media misinformation. But there are also some genuine clinical issues of relevance to people with existing health conditions, who are known to be more vulnerable to the disease. One particular topic that has left patients and health professionals alike confused and alarmed is the suggestion that ACE inhibitor drugs may increase the dangers of COVID-19.

First introduced in the early 1980s, ACE (angiotensin-converting enzyme) inhibitors were initially used for the treatment of high blood pressure, but their role has grown over the years to include the management of heart failure, heart attacks, diabetes and kidney disease. Given that roughly one-fifth of the adult population in the UK has diagnosed hypertension, and other cardiovascular conditions are widespread, these drugs are frequently prescribed. ACE inhibitors have grown to be the third most widely prescribed drug in UK primary care and, along with their close relatives – angiotensin receptor blockers, or ARBs – they accounted for 65 million prescriptions issued in the community in 2018.

ACE inhibitors work by reducing the activity of the body's major blood pressure regulatory mechanism, the renin-angiotensin-aldosterone system. When there is reduced blood pressure in the kidney, the body produces the enzyme renin, which leads to the production of a protein called angiotensin I. This protein doesn't have any effect on the body, but when it's converted by another enzyme – the Angiotensin Converting Enzyme, produced particularly in the lungs – into angiotensin II, this has potent vascular effects that increase blood pressure. ACE inhibitors block this enzyme and so prevent the rise in blood pressure.

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So why might this matter for COVID-19? To gain entry to human cells, a key trick employed by the coronavirus is to attach to a receptor on the surface of the cells which binds to an enzyme related to ACE, called ACE2. ACE2 has different functions to ACE, including inactivating angiotensin II.

ACE inhibitors do not appear to directly affect the action of ACE2. Nevertheless, they may have indirect effects that could lead to an increase in the number of ACE2 receptors. This has led to concerns that ACE inhibitors may facilitate COVID-19 disease, particularly as these drugs are used in older people with other health issues who we know are at risk of more severe respiratory complications.

Visualisation of the novel coronavirus. Photo by Fusion Medical Animation on Unsplash

However, the situation is not necessarily that simple. Previous work with the related condition SARS showed that reduced ACE2 (and with it, increased angiotensin II) was associated with severe lung injury. Based on this, ACE inhibitors and ARBs, by reducing angiotensin II, might actually be expected to be protective against severe lung problems. In an attempt to address these opposing theories, there is currently a clinical trial which is examining whether the ARB drug Losartan may have benefits in patients with COVID-19.

The balance of these risks and benefits is currently unknown. There is a lack of epidemiological evidence to support these drugs being either dangerous or therapeutically useful in the context of this coronavirus. One case study in China of more than 1,000 COVID-19 patients found higher rates of pre-existing cardiovascular disorders in those people with more severe viral disease, although their drug therapy was not examined. But even if one might expect ACE inhibitor or ARB use to be higher in those with cardiovascular disease, these patients are also likely to be at far higher risk of complications simply due to poor underlying cardiac, renal and respiratory function – disentangling the effects of disease and therapy requires far more study.

Many GPs are already being asked what they should do by understandably anxious patients, and are unsure of what to do themselves. Conflicting or misleading advice on social media has not helped the decision-making process. Discontinuation risks a deterioration in existing cardiovascular conditions, leading to further complications.

More research is clearly required, but in the absence of evidence to the contrary, the European Society of Cardiology put out a position statement

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strongly advising continuation of [ACE inhibitor and ARB therapy](#). In the meantime, it's essential that patients are provided with the facts as they are currently known in order for them to make the most informed decision they can about their care.

theconversation.com, 25 March 2020

<https://www.theconversation.com>

Cellphone tracking could help stem the spread of coronavirus. Is privacy the price?

2020-03-22

"IT IS POSSIBLE TO STOP THE EPIDEMIC." That's the message splashed atop [a website](#) built by a University of Oxford team this week to share new research on the spread of the novel coronavirus. Below that hopeful statement comes a big caveat: To stop the virus' spread, health officials need to find and isolate the contacts of infected people—lots of them—and fast. Such contact tracing is a mainstay of infectious disease control. But the Oxford team is one of several now advocating for a new approach: tapping into cellphone location data to track the spread of infection and warn people who may have been exposed.

Several governments in Asia have tried that approach in ways that would run afoul of privacy laws in many other countries. China, for example, has reportedly relied on mass surveillance of phones to classify individuals by their health status and restrict their movements. Now, research teams in Europe and the United States are considering less invasive ways to collect and share data about infections, and some are already developing and testing coronavirus-specific phone apps. Governments, meanwhile, are scrambling to figure out how these potential pandemic-fighting tools could work within data privacy laws and without losing the support of an already wary public.

"We don't live in a culture of public trust when it comes to data," says David Leslie, an ethicist at the Alan Turing Institute who studies the governance of data-driven technologies. "We live in this age that has been called the age of surveillance capitalism, where ... our data is abused and exploited." But, he adds, authorities and the public will have to weigh the value of privacy against the possibility that data collection could save millions of lives. "These are not normal times."

[Behind in the chase](#)

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Tracing the people an infected person recently came near requires widespread testing to diagnose infections in the first place. That testing has been **painfully slow to ramp up** in the United States and parts of Europe—to say nothing of countries elsewhere with fewer resources. Even as more tests become available, state and local health departments may not be able to interview every patient and follow up with every contact. And even the most painstaking interview can't reveal contacts or places that a person just doesn't remember.

The virus that is causing the pandemic, severe acute respiratory syndrome coronavirus 2, poses a particular challenge, says Oxford infectious disease epidemiologist Christophe Fraser. So far, it appears that nearly half of transmissions happen before an infected person has symptoms. That means the virus can spread for days before health authorities even learn of a spreader. "No matter how many resources you put into [contact tracing], it's never going to keep ahead of the virus," he says. "It's always going to be one or two generations ahead."

Fraser and his colleagues have watched U.K. coronavirus cases climb in recent weeks while new cases in China plummeted. Two postdoctoral researchers in his lab described their families in China using a phone app that told them when and where it was safe to go out. "We thought, 'Well, what would we do, if we [built] an app?'"

Fraser, with Oxford clinician David Bonsall and colleagues, designed a mathematical simulation of how "instantaneous digital contact tracing" would influence the spread of the virus. To stop the epidemic, health officials must reduce the virus' reproductive number—the average number of people each infected person transmits the virus to—to less than one. When the team modeled a scenario in which contacts were notified the instant a person tested positive, **it was possible to push the reproductive rate of the virus below that threshold**, the team reported in a preprint this week.

"It became obvious to us that this was solving a major problem," says Fraser, who adds that his team is advising several European governments, including the United Kingdom's, on digital tracking. The U.K. National Health Service announced on 19 March that it was developing a coronavirus contact tracing app.

[Digital tracking of many flavors](#)

At its simplest, digital contact tracing might work like this: Phones log their own locations; when the owner of a phone tests positive for COVID-19, a

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record of their recent movements is shared with health officials; owners of any other phones that recently came close to that phone get notified of their risk of infection and are advised to self-isolate. But designers of a tracking system will have to work out key details: how to determine the proximity among phones and the health status of users, where that information gets stored, who sees it, and in what format.

Digital contact tracing systems are already running in several countries, but details are scarce and privacy concerns abound. Protests greeted Israeli Prime Minister Benjamin Netanyahu's rollout this week of a surveillance program that uses the country's domestic security agency to track the locations of people potentially infected with the virus. South Korea has released detailed information on infected individuals—including their recent movements—viewable through multiple private apps that send alerts to users in their vicinity. "They're essentially texting people, saying, 'Hey, there's been a 60-year-old woman who's positive for COVID. Click this for more information about her path,'" says Anne Liu, a global health expert at Columbia University. She warns that the South Korean approach risks unmasking and stigmatizing infected people and the businesses they frequent.

But digital tracking is probably "identifying more contacts than you would with traditional methods," Liu says. A contact-tracing app might not have much impact in a city where a high volume of coronavirus cases and extensive community transmission has already shuttered businesses and forced citizens inside, she adds. But it could be powerful in areas, such as in sub-Saharan Africa, **that are at an earlier stage of the outbreak**, and where isolating potential cases could avert the need to shut down all schools and businesses. "If you can package this type of information in a way that protects individual privacy as best you can, it can be something positive," she says.

Navigating privacy laws

In countries with strict data privacy laws, one option for collecting data is to ask telecommunications and other tech companies to share anonymous, aggregated information they've already gathered. Laws in the United States and the European Union are very specific about how app and device users must consent to the use of their data—and how much information companies must disclose about how those data will be used, stored, and shared. Working within those constraints, mobile carriers in Germany and Italy have started to share cellphone location data with health officials in an aggregated, anonymized format. Even

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though individual users aren't identified, the data could reveal general trends about where and when people are congregating and risk spreading infection.

Google and Facebook are both in discussions with the U.S. government about **sharing anonymized location data**, *The Washington Post* reported this week. U.S. companies have to deal with a patchwork of state and federal privacy regulations, says Melissa Krasnow, a privacy and data security partner at VLP Law Group. App and devicemakers could face user lawsuits for sharing data in a way that wasn't originally specified in their terms of service—unless federal or local officials pass legislation that would free them from liability. "Now you've got a global pandemic, so you would think that [you] would be able to use this information for the global good, but you can't," Krasnow says. "There's expectations about privacy."

Another option is to start fresh with a coronavirus-specific app that asks users to voluntarily share their location and health data. For example, a basic symptom-checking app could do more than just keeping people who don't need urgent care out of overstretched emergency rooms, says Samuel Scarpino, an epidemiologist at Northeastern University. Health researchers could also use location data from the app to estimate the size of an outbreak. "That could be done, I think, without risking being evil," he says.

For Scarpino, the calculus changes if governments want to track the movements of a specific person who has coronavirus relative to the paths of other people, as China and South Korea have apparently done. That kind of tracking "could easily swing towards a privacy violation that isn't justified by the potential public health benefit," he says.

In Germany, which has some of Europe's strictest data privacy protections, the government can compel a technology company to share location data on an individual in the interest of national security, says Sebastian Golla, a legal scholar at the Johannes Gutenberg University of Mainz who studies data protection law. But indiscriminate mass tracking of individuals lacks a legal basis, he says. To track people who have or might have coronavirus, Germany and other European countries would need to pass laws specifying how data collection would be restricted to a certain population, for a certain time, and for a certain purpose.

Such laws could be on the way. On 21 March, *Frankfurter Allgemeine Zeitung* reported that the German health ministry had drafted changes to a law called the Infection Protection Act to allow, among other things, **the**

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tracking of people who were in contact with those infected with the coronavirus.

The next generation of coronavirus trackers

Several emerging projects aim to set up voluntary, privacy-conscious phone tracking systems. This week, a team led by computer scientist Ramesh Raskar at the Massachusetts Institute of Technology released a prototype of an app called **Private Kit: Safe Paths**. The app stores up to 28 days of a user's GPS location data, logged every 5 minutes. If the user tests positive for coronavirus, they can choose to share their recent data with health officials to identify and publicize the places where others may have been at risk of infection.

A future iteration of the app, soon to be released, would compare a user's recent locations against the path of an infected person and alert them of potential contact. Users wouldn't learn anything else about the infected person—not their age, their sex, or their geographic path. The team, which includes collaborators from Harvard University and the Mayo Clinic, is in discussions with "a dozen cities and nations in all parts of the world," about running pilot trials of the app, Raskar says.

Another app in development in Germany relies partly on location data that Google already stores for its account holders. A person who tests positive could use the app—called GeoHealth—to "donate" their location history. That data would then be anonymized and stored on a central server, says Gernot Beutel, a stem cell transplant physician at Hannover Medical School who is co-developing the technology. A data analytics platform designed by the software company Ubilabs would compare users' movement history to that of infected people, and the app would show them color-coded alerts based on how recently they may have encountered the virus. Though a combination of GPS tracking, wireless network data, and connections between phones via Bluetooth, Beutel says the app should be able to detect when a phone comes within 1 meter of another phone.

Making data submissions voluntary and anonymizing data are "good options to maintain civil rights. It's a clean way of legally doing it," Golla says. But such apps will reduce the spread of disease only if a lot of people use them. Liu cautions that because a tracking app can't capture every possible source of infection, it risks creating a false sense of security for users. "Just because you don't see a dot on a map where a contact might have been doesn't mean that areas that don't have dots don't have infected people."

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Raskar's team is working to figure out how many people would need to use the Private Kit app for it to be effective at controlling disease spread. He can't say how many people have downloaded the prototype; the researchers don't collect that information for privacy reasons, he says. Beutel is hopeful that the urgency of the pandemic will inspire much of the population to lay bare their movements and health status. "People give their stem cells for patients that need a stem cell transplantation. They give their blood," he says. "We hope that people think about the crisis, and are willing to give their data."

sciencemag.org, 22 March 2020

<https://www.sciencemag.org>

Physicists brawl over new dark matter claim

2020-03-26

For decades, astrophysicists have thought some sort of invisible dark matter must pervade the galaxies and hold them together, although its nature remains a mystery. Now, three physicists claim their observations of empty patches of sky rule out one possible explanation of the strange substance—that it is made out of unusual particles called sterile neutrinos. But others argue the data show no such thing.

"I think that for most of the people in the community this is the end of the story," says study author Benjamin Safdi, an astroparticle physicist at the University of Michigan, Ann Arbor. But Kevork Abazajian, a theoretical physicist at the University of California, Irvine, says the new analysis is badly flawed. "To be honest, this is one of the worst cases of cherry picking the data that I've seen," he says. In unpublished work, another group looked at similar patches of sky and saw the very same sign of sterile neutrinos that eluded Safdi.

Astrophysicists think each galaxy forms and resides within a vast clump, or "halo," of dark matter, like the pit in a peach. The gravity of the invisible substance helps prevent the stars within from flying off into empty space. Theoretical physicists have dreamed up numerous hypothetical particles that might make up dark matter, among them cousins to nearly massless, barely detectable subatomic particles called neutrinos, which gush out of the Sun and nuclear reactors. The particles that make up dark matter would be hypothetical "sterile" neutrinos, heavier and even more elusive. An ordinary neutrino can interact with an atomic nucleus; sterile neutrinos would only interact with other neutrinos, arising when an ordinary

Very rarely, a sterile neutrino would decay into an ordinary neutrino and an x-ray, which would have an energy equal to half the sterile neutrino's mass.

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neutrino morphs into a sterile one through a process called neutrino mixing.

The idea that sterile neutrinos might make up dark matter got a boost in 2014. Observations of nearby galaxies and the center of our own Milky Way revealed a faint glow of x-rays with a specific energy, 3.5 kilo-electron volts (keV). That glow would be expected if sterile neutrinos with a mass of 7 keV pervaded the galaxies. Very rarely, a sterile neutrino would decay into an ordinary neutrino and an x-ray, which would have an energy equal to half the sterile neutrino's mass.

But a new analysis of astronomical observations shows the telltale glow cannot come from dark matter, Safdi and colleagues report today in *Science*. They looked at data not from distant galaxies, but from blank spans of sky between the stars in more than 4000 archival images snapped by XMM-Newton, an x-ray space telescope launched in 1999 by the European Space Agency. If our own galaxy lies within a vast cloud of sterile neutrinos, then the telescope must be peering through that cloud—and the sky between the stars should also faintly glow with 3.5-keV x-rays.

Safdi's team found no sign of such a glow. The no-show suggests the glow in distant galaxies isn't coming from dark matter, but from some more ordinary source such as hot gas, Safdi says.

Alexey Boyarsky, an astroparticle theorist at Leiden University, is unconvinced. "I think this paper is wrong," he says. Boyarsky says he and his colleagues performed a similar, unpublished analysis in 2018, also using images from XMM-Newton, and did see a 3.5-keV glow from the empty sky, just expected from peering through a halo of sterile neutrinos.

How do two groups look at the same data and come to opposite conclusions? The difference lies in their methods, Boyarsky says. Because our galaxy is filled with a thin ionized gas, the sky emits x-rays, which can peak at specific energies even without a contribution from dark matter. The XMM-Newton telescope itself can also glow and emit x-rays at certain energies. And some x-rays come from beyond our galaxy, too. To see a 3.5-keV glow from dark matter, researchers must sift it from those background contributions.

To do that, Boyarsky and colleagues analyzed the entire spectrum of x-ray energies that XMM-Newton can detect, modeled the entire background, and subtracted it from the data. Crucially, Boyarsky says, his team removed known peaks at 3.3 keV and 3.7 keV to reveal the unexplained 3.5-keV peak. Safdi says his team took a different approach. Borrowing statistical

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techniques developed at atom smashers, they analyzed the spectrum from each image separately and analyzed data only over a much narrower range of energies.

However, that energy range isn't much wider than the peak the team is looking for, Abazajian says. Boyarsky adds that because Safdi and his team did not take out the two other background peaks, they may have mistaken a plateau created by the three overlapping peaks for a flat spectrum.

Not so, Safdi Says. His team found that subtracting the other peaks and widening the energy window doesn't change the result. If a 3.5-keV peak exists, he says, his team's more sophisticated technique would have revealed it.

Boyarsky says he is going to try to publish his blank-sky analysis. A physics journal turned it down, saying it wasn't sufficiently "interesting," he says. Now, he says he will submit it to *Science*. "I don't care if it gets published, but I would like it to be peer reviewed," he says. "They can't say it isn't interesting."

sciencemag.org, 26 March 2020

<https://www.sciencemag.org>

How sick will the coronavirus make you? The answer may be in your genes

2020-03-27

COVID-19, caused by the new pandemic coronavirus, is strangely—and tragically—selective. Only some infected people get sick, and although most of the critically ill are elderly or have complicating problems such as heart disease, some killed by the disease are previously healthy and even relatively young. Researchers are now gearing up to scour the patients' genomes for DNA variations that explain this mystery. The findings could be used to identify those most at risk of serious illness and those who might be protected, and they might also guide the search for new treatments.

The projects range from ongoing studies with DNA for many thousands of participants, some now getting infected with the coronavirus, to new efforts that are collecting DNA from COVID-19 patients in hard-hit places such as Italy. The goal is to compare the DNA of people who have serious cases of COVID-19 (which stands for coronavirus disease 2019)—but no underlying disease like diabetes, heart or lung disease—with those with

Only some infected people get sick, and although most of the critically ill are elderly or have complicating problems such as heart disease, some killed by the disease are previously healthy and even relatively young.

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mild or no disease. “We see huge differences in clinical outcomes and across countries. How much of that is explained by genetic susceptibility is a very open question,” says geneticist Andrea Ganna of the University of Helsinki’s Institute for Molecular Medicine Finland (FIMM).

It’s hard to predict what will pop out from these gene hunts, some researchers say. But there are obvious suspects, such as the gene coding for the cell surface protein angiotensin-converting enzyme 2 (ACE2), which the coronavirus uses to enter airway cells. Variations in the *ACE2* gene that alter the receptor could make it easier or harder for the virus to get into cells, says immunologist Philip Murphy of the National Institute of Allergy and Infectious Diseases, whose lab identified a relatively common mutation in another human cell surface protein, CCR5, that makes some people highly resistant to HIV.

Ganna heads up a major effort to pool COVID-19 patients’ genetic data from around the world. The idea “came quite spontaneously” about 2 weeks ago when “everyone was sitting at their computers watching this crisis,” says Ganna, who is also affiliated with the Broad Institute, a U.S. genomic powerhouse.

He and FIMM Director Mark Daly quickly created a **website** for their project, the COVID-19 Host Genetics Initiative, and reached out to colleagues who run large biobank studies that follow thousands of volunteers for years to look for links between their DNA and health. At least a dozen biobanks, mostly in Europe and the United States, have expressed interest in contributing COVID-19 data from participants who agreed to this. Among them are FinnGen, which has DNA samples and health data for 5% of the 5 million-person Finnish population, and the 50,000-participant biobank at the Icahn School of Medicine at Mount Sinai.

The UK Biobank, one of world’s largest with DNA data **for 500,000 participants**, also plans to add COVID-19 health data from participants to its data set, the project **tweeted** this month. And the Icelandic company deCODE Genetics, which is **helping test much of the nation’s population** to see who is infected with the new coronavirus, has received government permission to add these data and any subsequent COVID-19 symptoms to its database, which contains genome and health data on half of Iceland’s 364,000 inhabitants, says its CEO Kári Stefánsson. “We will do our best to contribute to figuring this out,” Stefánsson says.

Another effort to identify protective or susceptibility DNA variants is the **Personal Genome Project** led by Harvard University’s George Church, which recruits people willing to share their full genome, tissue samples,

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and health data for research. Earlier this month, it sent questionnaires to its thousands of participants, asking about their COVID-19 status. More than 600 in the United States responded within 48 hours. “It seems that most people want to do their part,” says Church, whose group isn’t yet part of Ganna’s collaboration.

Other researchers working with Ganna’s initiative are recruiting COVID-19 patients directly within hospitals for such genomics studies. Italian geneticist Alessandra Renieri of the University of Siena expects at least 11 hospitals in the nation to give ethics approval for her team to collect DNA samples from willing patients. “It is my opinion that [host] genetic differences are a key factor ... for susceptibility to severe acute pneumonia,” Renieri says.

Pediatrics researcher Jean-Laurent Casanova at the Rockefeller University, who specializes in identifying rare genes that can make healthy young people susceptible to certain serious diseases, is drawing on a network of pediatricians around the world to look for the relatively few young people who develop COVID-19 serious enough to get admitted to intensive care. “We study exclusively patients who were previously healthy” and under 50, as their serious COVID-19 illness is more likely to have a genetic basis, he explains.

In addition to genetic variants of the ACE2 receptor, scientists want to see whether differences in the human leukocyte antigen genes, which influence the immune system’s response to viruses and bacteria, affect disease severity. And some investigators **want to follow up** a finding, which a Chinese team **reported in a preprint**: that people with type O blood may be protected from the virus. “We’re trying to figure out if those findings are robust,” says Stanford University human geneticist Manuel Rivas, who is contributing to Ganna’s initiative.

The catastrophic spread of the coronavirus should soon increase the number of COVID-19 patients available to these gene hunts. And that could speed findings. Ganna expects the first susceptibility genes could be identified within a couple of months.

sciencemag.org, 27 March 2020

<https://www.sciencemag.org>

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Are You “Essential”? Ohio Guidance for Environmental Industries Regarding COVID-19

2020-03-23

On Sunday, Ohio issued a “shelter in place” or “stay at home” order, bringing the total number of states with these orders to ten. The other states are California, Delaware, Illinois, Louisiana, Michigan, Nevada, New York, New Jersey, and Pennsylvania, and this number increases by the day. The orders and associated guidance identify which businesses and specific activities are considered “essential,” and therefore exempt from travel and other aspects of the stay at home orders. The orders vary significantly from state to state.

California was the first state to issue a shelter in place order, and it is consistent with the March 19 federal Department of Homeland Security Cybersecurity and Infrastructure Security Agency (CISA) Memorandum on Identification of Essential Critical Infrastructure Workers During COVID-19 Response. CISA’s Memorandum explains that its “list [of essential activities] is advisory in nature” and should not be considered “a federal directive or standard in and of itself.”

Ohio’s order builds on the California and subsequently-issued Illinois orders. Key environmental businesses and activities are permitted to remain open, including those concerning governmental functions related to environmental compliance, essential infrastructure, and manufacturing and supply chain for critical products and industries.

- The order, issued by Dr. Amy Acton, Director of the Ohio Department of Health, becomes effective at 11:59 PM today, and requires residents to stay at home except for certain activities, including “Essential Activities,” “Essential Government Functions” and “Essential Business or Operations.”
- Essential Activities include those for health and safety, necessary supplies and services, outdoor activity, and certain types of work.
- Essential Government Functions are defined to include “governmental employees working for or to support Essential Businesses and Operations,” and specifically include hazardous materials responders and services to “support the health, safety and welfare of the public,” and includes contractors.
- Essential Business and Operations include “businesses that sell, manufacture or supply other Essential Businesses and Operations” with the support or materials necessary to operate, including electrical,

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chemicals, paint and others; and manufacture, distribution and supply chain for critical products and industries, such as chemicals, sanitization, waste pickup and disposal, agriculture, energy, steel, petroleum and fuel, mining and construction.

- Ohio’s order also incorporates the CISA guidance discussed above for purposes of defining “essential” businesses and operations. The CISA list includes:
- “Critical” manufacturing (i.e., those necessary for materials and products for medical supply chains, transportation, energy, communications, food and agriculture, chemicals, water and wastewater, etc.);
- Energy, including workers who maintain, ensure or restore generation, transmission and distribution and natural gas transmission and distribution pipelines;
- Water and wastewater operational staff;
- Public works, including those who support the operation of bridges and construction of critical or strategic infrastructure;
- Hazardous materials, including at nuclear facilities and hazardous materials response and cleanup.
- Ohio’s order also exempts “Essential Infrastructure” including food production, construction (including but not limited to construction required in response to this public health emergency, hospital construction, construction of long-term care facilities, public works construction, school construction, essential business construction, and housing construction), utilities operation, distribution centers, oil and biofuel refining, solid waste and recycling collection and removal.

The recent orders issued by Ohio and Illinois are more specific than others, such as California’s and New York’s, in their identification of specifically exempted activities, as summarized above.

Finally, several states, including Ohio and Illinois, have included provisions permitting leaving the home for “Minimum Basic Operations.” This term is defined to mean “activities to maintain the value of the business’s inventory, preserve the condition of the business’s physical plant and equipment, ensure security, process payroll and employee benefits, or for related functions.”

[natlawreview.com](https://www.natlawreview.com), 23 March 2020

<https://www.natlawreview.com>

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Your actions alone can't save the planet—but these habits can help

2020-03-25

When Earth's woes come in large numbers—10,000 microplastic particles per liter of Arctic sea ice, 30,000 species at risk of extinction—we may doubt the power of this small number: one. As in, **one** person, ready to help.

It's true that individual acts alone can't cure what ails the planet. But each **one** of us can find ways to contribute to the solutions—in our homes, our neighborhoods, and the wider world.

In the home

Become an eco-friendly **pet owner**: Be careful how you use flea and tick products containing pesticides. Avoid cat litter made of materials obtained by strip-mining.

Minimize **food waste**: Use a digital meal planner to calculate ingredients and portions so virtually everything you buy and cook gets eaten. Learn how to store foods to prolong their usability.

Keep food scraps and waste out of landfills by **composting**.

Be sure to properly **insulate** your home and replace old, drafty windows with energy-efficient ones.

At the store

Green your **coffee** habit. Get a reusable filter pod for your single-use coffee machine—and fill it with certified "bird friendly" coffee grown in a habitat that also nurtures birds.

Be choosy when buying **home tissue**. Know which products are made of virgin wood pulp, which contribute to destruction of forests. Instead of buying paper towels and paper napkins, use cloth towels, napkins, and rags when possible.

Consider dropping meat from a few meals, or completely.

In the neighborhood

Help keep your community's vegetation healthy by organizing **tree-planting projects or pruning and weeding outings** to eliminate invasive plants.

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Plant **pollinator gardens**.

With help from local water and conservation officials, arrange a **cleanup of a creek** or other waterway in your community.

As a citizen

Know the requirements for **testifying at hearings** or submitting written comment when federal agencies are seeking public input on an action or rule under consideration.

[nationalgeographic.com](https://www.nationalgeographic.com), 25 March 2020

<https://www.nationalgeographic.com>

In A Global Health Emergency, the Bicycle Shines

2020-03-25

Speaking in Parliament in London earlier this year, Chris Boardman, the former Olympian cyclist and the walking and cycling commissioner of Manchester, said: "Pick a crisis, and you'll probably find cycling is a solution."

He was talking about climate, health and air pollution, but he also might as well have been talking about coronavirus.

As Covid-19 rages, almost half of the world's population is under some form of restricted movement. In a bid to slow the spread of coronavirus, people must stay home, aside from strictly limited essential trips for food and medicine and a daily outing for exercise. We all need to comply with restrictions to bring this life-threatening virus under control. I believe the best way to keep a safe distance from others when we do move is by walking, and cycling.

Many experts view cycling as a safe way to avoid crowded public transportation systems — and the citizens in a number of world cities appear to agree. In New York, cycling spiked by 52% over the city's bridges after social-distancing protocols were put in place. In Chicago, bikeshare use doubled in early March. In Dublin and London, advocates are offering support to new riders who are taking to the streets in droves.

Cycling can help communities in "food deserts" access shops that are farther than a walk away. It speeds the delivery of food and medicine for households without a car, or those who are quarantined at home. And it helps people avoid car trips, cutting air pollution and freeing up public transit for those who absolutely need it.

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But each one of us can find ways to contribute to the solutions—in our homes, our neighborhoods, and the wider world.

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To protect people doing essential trips — including medical staff, who need to get to work — networks of emergency cycleways could be built quickly and cheaply, using easy-to-install temporary bollards and wands, as the city of [Seville once did](#). Low-traffic neighborhoods can connect those routes, stopping shortcutting drivers using residential streets with low-tech planters and bollards, while allowing residents in and out by bike. During the crisis, and as society recovers, this network could keep residents active and healthy, where local restrictions permit. It would also be free to use — more valuable than ever amid a global economic disruption. Once we reach the other side, communities could decide whether to keep the new infrastructure or not.

This is hardly the first time that cities have used cycling as an emergency transportation solution. The usefulness of bicycles in disaster recovery was demonstrated anew after severe earthquakes in [Mexico City in 2017](#) and [Tokyo in 2011](#). A broader global crisis — the 1973 OPEC oil embargo — offered another opportunity for bicycles to step up. That shock to the gasoline supply dealt a severe blow to daily life in the U.S. and many car-dependent Western European nations. But in the Netherlands, where the country's own mid-century car boom had driven up road fatalities and stoked widespread public protests, it helped trigger a transport revolution. The Dutch government enacted a mass program of cycle track construction that continues to this day. Now, nearly 30% of all trips nationwide happen on a bike, and cities are even connected by bicycle "superhighways."

Even if they are not building new infrastructure, other places are protecting the right to cycle during the pandemic crisis.

As with the oil crisis, city leaders around the world have responded in different ways to keep people moving during the coronavirus emergency. It is heartening to see many governments recognizing and uplifting the value of the bike: [Bogotá, Colombia, is installing tens of kilometers of emergency cycleways](#) to keep people moving while enhancing social distancing. The mayor, Claudia López, [described cycling](#) as "one of the most hygienic alternatives for the prevention of the virus." Mexico City is [now considering a similar plan](#). In the U.S., New York City leaders are looking at ways to accommodate new riders, and say they will build [two emergency bicycle lanes](#) to plug gaps in the network.

And even if they are not building new infrastructure, other places are protecting the right to cycle. Last week, Germany's Federal Minister of Health, Jens Spahn, recommended that people walk or cycle to work

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rather than use public transport as states around the country impose lockdowns. Amsterdam residents, already avid cyclists, are [being encouraged to ride to stay healthy](#) while public gatherings are banned and social distancing orders are in place. In London, the city's [bikeshare system is now free for health workers to use](#). And in [New York, San Francisco, Berlin, and across the U.K.](#), bike shops have been allowed to stay open as essential services — but not so everywhere else.

Alas, not all nations are in the same lane. France and Spain, two European nations worst hit by coronavirus, are in the latter camp, having banned recreational cycling in attempts to contain the virus's spread. In France, people are restricted to within two kilometers of home for exercise, and it is not clear whether cycling for essential trips is permitted. In Italy, only cycling for essential trips is permitted, and for physical activity, so long as people stay one meter apart. In Spain, [riders flouting leisure cycling bans have been fined](#).

That is why, prior to the U.K.'s lockdown, more than 80 experts in transportation and public health signed a [letter](#) asking the U.K. government to allow safe walking and cycling to continue during the pandemic. "Confinement, sometimes in overcrowded accommodation with little or no private green space, and particularly during times of anxiety has health risks," their letter states, adding that green spaces should be kept open for walking and cycling, to allow for exercise and the psychological benefits that accompany it. For trips such as shopping, and for those critical workers who still need to commute, walking and cycling should be supported. "We call on decision makers to protect the right to walk and cycle safely (from risk of infection and traffic injury) for those who are not symptomatic."

citylab.com, 25 March 2020

<https://www.citylab.com>

How we can redesign cities to fight pandemics

2020-03-24

Throughout history, disease outbreaks have forced new innovations in urban design: Fighting cholera epidemics in the 1800s, for example, necessitated the building of new plumbing and sewer systems and the devising of new zoning laws to prevent overcrowding. As the new coronavirus lays bare the need for broader changes across our economy, such as widespread paid sick leave, it might also influence how cities and buildings are built.

As the new coronavirus lays bare the need for broader changes across our economy, such as widespread paid sick leave, it might also influence how cities and buildings are built.

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“There’s an interesting nexus that’s happening with the increase in thinking about chronic health in cities and the health districts that we’re designing . . . and this particular epidemic,” says David Green, a principal at Perkins and Will, a design firm that has worked on “health districts” that address wider health issues such as walkability as a tool to reduce obesity and diabetes. “I think that the next couple of months, especially, and the next year, is going to fundamentally change the way we think about the design of cities.”

One part of that might mean creating buildings that can quickly switch to a different use in the case of an epidemic or another type of disaster. “We’ve been looking at redesigning public spaces so that they can also work as logistics and treatment areas in cities for epidemics like this,” Green says. The firm is also studying how urban design affects the current outbreaks. “We’re working through the process of evaluating the spread of this epidemic as it ties to the physical design of cities, which includes things like population density.”

VIRUS-FREE TRANSIT

Better design could also help reduce crowds where viruses can easily spread. At airports, for example, security screening could be done differently so that passengers aren’t forced to wait together in crowded lines. “New and upgraded airports are being designed to increase security screening lanes and reduce pinch points in passenger flow,” says Arathi Gowda, associate director of high-performance design at Skidmore, Owings & Merrill (SOM). “This, along with automated screening lanes, reduces passenger wait time, congestion, and person-to-person contact.” In another approach, Changi Airport recently shifted to [contactless screening for returning citizens](#).

Lionel Ohayon, founder and CEO of Icrave Design, a design firm that works in airports and stadiums, suggests that passengers might eventually be screened when they board autonomous vans headed to the airport, rather than at the airport itself. Inside airports, better design could help reduce crowds of people waiting at gates to board.

While it’s hard to eliminate crowds once people are on an airplane, the biggest risk comes from sitting near someone who is sick; the air onboard is well-filtered so viruses won’t circulate further. That level of air quality treatment should be happening in other places. “We can do it in our public transportation system, but it’s not done,” says Luke Leung, director of sustainable engineering at SOM. It should also be happening inside more buildings. “Not only is this something that we should think about, this is

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something that we must think about, because we spend 90% of our time indoors,” he says. “Buildings have to be the secret weapon in the future to combat infectious diseases.”

Newer technology is making it more cost-effective to make air much cleaner. UV-C light, for example, can eliminate viruses in air treatment systems while simultaneously making equipment last longer. (Traditional air filters add costs partly because it takes more energy to push air through them.) Bringing fresh air into buildings is also important, as is improving ventilation outside in dense neighborhoods. “If you have fresh air coming in, it will minimize the time that you’re exposed to anything,” Leung says. Future technology will be able to do more—sensors that can detect viruses on surfaces in real time, he says, are coming, and can be used to warn building occupants or trigger air cleaning.

Some buildings are also beginning to deploy temperature screening to identify people who might be ill. “China and several other countries are currently measuring occupants’ temperatures prior to entering a building using an infrared thermometer, or alternately, utilizing thermal imaging,” says Gowda. “This was quickly deployed to mitigate the spread of COVID-19. This is not considered a positive test for COVID-19 or other viruses, but both technologies can be administered externally in order to minimize the risk of infection or the need to wear masks or other protective equipment. Typically, when people have a fever, they are at a very contagious point in their illness—with this technology, they can be made aware and directed to the appropriate avenues of testing and potentially quarantine to minimize person-to-person transmission. We are starting to see this technology in some hospitals in the United States, but it should be thought of as one of our first lines of defense in all buildings, with applications beyond healthcare environments.”

HOSPITALS DESIGNED FOR OUTBREAKS

Hospitals, of course, can also be better designed to handle outbreaks of infectious diseases. The hospital at Rush University in Chicago has an ambulance bay that is designed to be closed off, so that patients can be safely evaluated there before entering the hospital. Inside, negative pressure zones that limit the spread of the virus can be turned on in multiple areas. Hospital rooms can also transform. “If you suddenly become very, very sick like some of these patients are they can immediately turn [an acute care] room into a critical care ICU room,” says Marvin Williams, a senior medical planner at Perkins and Will and a former emergency department director. Hospitals and clinics can also

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add purpose-built telehealth centers to make it easier for doctors to treat patients remotely and avoid the potential spread of a virus.

PARKS HELP CITIES BREATHE

More holistic approaches to making cities and buildings healthy can also impact future epidemics by making it less likely that people get sick, and more likely that they avoid the most serious consequences. As one example, SOM is beginning to add more outdoor space to its designs, even in super-tall buildings. One reason that access to outdoor space is important: A large percentage of Americans are vitamin D deficient, and some [studies](#) have linked higher vitamin D levels to a reduced risk of acute respiratory tract infection.

Similarly, easy access to parks encourages people to spend time outside. Parks also encourage people to exercise, and they reduce air pollution. Polluted air is [linked to health problems](#) such as asthma, high blood pressure, and diabetes, all of which are associated with a higher risk for patients with the new coronavirus. (Walkable neighborhoods, by contrast, are [linked to a lower risk for problems such as high blood pressure](#).) The idea that parks can clean the air isn't new; it was used as justification for building Central Park and other major city parks in the 1800s.

"Even though [landscape architects] didn't have the science behind it, it was enough to build places like Central Park, the Emerald Necklace in Boston, and do a large tree-planting campaign in Chicago," says Sara Jensen Carr, an architecture professor at Northeastern University and the author of an [upcoming book](#) about how past epidemics have influenced urban design. In the current crisis, she says, parks are also functioning as an escape. "Being outside is one of the safer activities we can do right now. I think it speaks to the importance of having those spaces everywhere."

HANDWASHING EVERYWHERE

Some potential changes in cities could be relatively simple. In Kigali, Rwanda, the city recently rolled out [temporary handwashing stations](#) at bus stops and started asking riders to wash their hands before boarding. The portable sinks are also in place at retail stores, banks, and restaurants. While the U.S. has done something similar to a limited extent near homeless communities, it's possible to imagine that this type of infrastructure could become permanent at key places such as public transit hub.

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"If you're walking around the city and there's actually nowhere where you can wash your hands or use a public toilet, you've actually created a scenario that you're forcing people to actually take risks that they maybe don't want to take," says Ohayon. In some cases, it might make sense to take cues from hospital design, where sinks are deliberately placed to make people more likely to wash their hands. Ohayon points to an example of one hospital that he worked on. "As soon as you get off the elevator on any floor of that hospital, there's a handwashing area that's central," he says. "It would almost be embarrassing, or you would know that you stepped through it without washing your hands, and there's a room full of people looking at you."

None of these changes in infrastructure and design would replace the need for other changes in public health, such as a commitment to respond and test much more quickly in the case of an outbreak. But as [environmental changes make future epidemics more likely](#), and as the population ages and cities continue to grow denser, it makes sense for urban design also to change. Seeing the devastation in countries such as Italy may be enough to convince more communities to invest in solutions that have been considered optional extras in the past. "We have a lot of tools," says Gowda. "We're not deploying them. I think this is a moment for us to really think we actually can change, in a community spirit, for a greater good." It's similar, she says, to interrelated issues such as climate change that also have solutions ready to deploy. "There's an idea we're too big to change, but we're not. We're fundamentally an urban fabric, a community, and we can change quite quickly."

[fastcompany.com](#), 24 March 2020

<https://www.fastcompany.com>

Could tribal honey hunters help save the bees and improve our food security?

2020-03-23

Even as modern science grapples with the rapidly declining bee population, we could look back and take a lesson on sustainability from the ancient culture of the adivasis (the first people) of the Nilgiris.

Covering over three states of Kerala, Tamil Nadu and Karnataka, the Nilgiri Biosphere Reserve is home to over eighteen ethnic groups. Of them, Kattunaickens, Kurumbas, Sholigas and Irulas are known to be the primary honey hunter tribes. Traditionally, these tribes hunt for honey on the cliffs

Of them, Kattunaickens, Kurumbas, Sholigas and Irulas are known to be the primary honey hunter tribes.

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of the Nilgiris (translates as blue mountains), atop high trees, inside tree cavities and also in underground hives (*puthu thaen* or burrow honey). In recent times, with reduced forest cover, climate change and government restrictions, it has become increasingly difficult for these tribes to collect wild honey.

Even as we begin the honey trail for our story, early rains play spoilsport and the locals were worried that it would drive off the bees. Such unpredictable rains are a recent phenomenon in the Nilgiris, which has had a direct impact on honey availability and hence the honey bees and the honey hunters. After months of follow up, we finally meet up with Masanan, an Irula tribal from Masinagudi in Nilgiris district, who belongs to a family of honey gatherers.

He said, "When I used to go with my father for gathering honey, there would be 15 combs in a cliff. Now there are hardly six."

He tells us that their community treats the bees as sacred beings and they hold prayers before they leave for harvesting the honey. Even as we walked miles across the outskirts of the forest, Masanan knew the location of the bee hives, be it atop the trees, or in cavities or cliffs, like the back of his hand. He points to how the bees always prefer a place near a water source and also about how the flowering season impacts the quality of honey.

"We always wait till April to harvest honey, as it gives a better survival rate for the larvae and mature honey (with less water content) for us. Traditionally, we do not use destructive methods like crushing the hives or burning it. Our elders use the herbs in the forest to create smoke that drives away the bees. We then harvest only what is necessary for us, leaving enough for the bees to sustain. For instance, if there are few hives in the cliff, we leave 60 percent untouched for the bees come back to the same place every year," added Masanan.

Sasi, a Kattunaicker tribal member from the neighbouring Coonoor agrees that this practice is common amongst their honey gatherers too.

Masanan smiled, "We live and let live."

Keeping the buzz alive

We stood there watching in amazement as hundreds of bees buzzed around him and he did not swat even one, "Normally, one or two bees will sting us, but if he hit them, hundreds will swarm us recognizing the smell of the dead bee. So, while you watch, make sure you do not kill even a

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single bee," he warns, taking out the honey, undeterred by the (literal) buzz around him.

But not every tradition has survived time. Masanan, for instance, uses his *beedi* (native cigar) to smoke out the beehive we found. He was able to save the brood of the hive in the tree cavity, but in the tree branches, it sometimes becomes impossible to cut the honey without striking the brood. "Unlike *petti then* (box honey) apiculture, we cannot always tap just the honey," he said..

Justin Raj, a beekeeping expert with conservation NGO Keystone Foundation, tells us that most tribes in Nilgiris traditionally follow a sustainable method of honey harvesting. "Our job is to ensure that they stick to these sustainable and clean practices through training workshops," he said. "First, we request them not to touch or attack the queen cell. And as is their traditional practice, if there find seven combs, we ask them to harvest only three. We also request them to take out just the honey part (wherever possible) and leave the brood with the larvae intact. Lastly, we ask them to wait for over six months to gather mature honey with less water content and less damage to the bees."

Be it apiculture or wild honey harvesting, Keystone Foundation insists that the honey gatherers they work with follow sustainable honey harvesting practices and their products are given a better market price for following sustainable methods.

Bharath Kumar Merugu, Project Lead, Just Change works with over 175 Kattunayakar honey gatherers through a tribal union called 'Thenkootam' (*then* – honey, *kootam* – crowd) under the umbrella of Adivasi Munetra Sangam. "We think it is important to support sustainable non-timber produce like honey and coffee. This will ensure that our tribal people turn protectors of the forest even while guaranteeing them a reliable livelihood option. The price of the honey is fixed by the tribal union themselves, we merely help them reach a better market."

Ecologist Godwin Vasanth Bosco agrees that it is crucial to include the indigenous tribes instead of keeping them out of the forests and even perhaps use their traditional expertise to conserve the wild bees in the Nilgiris. He opines that it is equally important to educate farmers in the biosphere to stay off harmful pesticides that could directly impact the bee population. Several villagers of the Athakarai Village in Nilgiris district we spoke to also confirmed that swarms of bees die after visiting pesticide-ridden jasmine farms in the region.

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In India, conservation has primarily focused on introducing the European species *Apis mellifera*, renowned for easy domestication and high yield of honey. But studies show that this has had an adverse impact on the native rock (*A. dorsata*) and hive bees (*A. cerana indica*) as they compete for food. This loss of bee diversity could directly impact the plants dependent on it for pollination.

HariPrasad, Professor – Agri-entomology, Annamalai University informs us that the European bee, which is the most domesticated in the world is also easily disease-prone. He says, "Of the five prominent bee species in India, the rock bees or *A. dorsata* species are the major honey yielders. But they cannot be domesticated. The Dammer bee (*Melipona irridipennis*) on the other hand is good for cross-pollination even though the honey yield is less." It is therefore important to find the middle ground between sustainability and utility.

HariPrasad suggests that improving the local food source by making it pesticide-free could play a major role in conserving bees and biodiversity of the region. He also suggests that initiatives like providing mountaineering kits for personal safety and training on sustainable production of value-added products from beeswax and pollen could help the tribals gain more profit and enable them to become part of the solution.

Mudhan, an Irula tribe member from Masinagudi suggests it will be good if traditional honey gatherers like them are given training in apiculture, where they could breed indigenous bees throughout the year.

He added, "Irrespective of the jobs we do, in the summer, we would always want to go back to the cliffs. Our lives and culture are always intertwined with these bees."

india.mongabay.com, 23 March 2020

<https://www.india.mongabay.com>

Coronavirus-themed foods aim to raise a smile during the crisis

2020-03-27

Among global efforts to offer some light relief to the current crisis, bakers and chefs have been producing coronavirus-related dishes that are hopefully a lot tastier than the epidemic which has inspired them.

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In Hanoi, Vietnam, a chef at Pizza Home has created a coronavirus-themed burger.

Hoang Tung says he dreamed up the burgers, which feature green-tea stained buns with tiny "crowns" designed to look like microscopic images of the virus, to take the fear out of the infectious disease.

"We have this joke that if you are scared of something, you should eat it," Tung told [Reuters](#).

'Corona burger'

"That's why the coronavirus isn't scary any more after you eat a burger in the shape of the virus itself. That way of thinking spreads joy to others during this pandemic."

According to Reuters, the takeaway shop is currently selling around 50 of the burgers every day, which is particularly impressive considering the number of businesses that have been forced to close down as a result of the pandemic.

In France, pastry chef and chocolatier Jean-François Pré opted to create coronavirus Easter eggs.

The chocolate eggs, which have been painted black, are dotted with red painted almonds to replicate how the virus looks while viewed under a microscope.

Pré told French language newspaper [Le Telegramme](#) he devised the eggs to bring some humor to the situation after growing "tired of hearing" about coronavirus.

He began selling them at his shop in Landivisiau, which is located in Brittany, northwestern France, earlier this month, a few weeks before France went into lockdown.

Toilet humor

Meanwhile in western Germany, the Schuerener Backparadies bakery has added two different coronavirus-themed creations to its selection.

Not only can customers buy biscuit versions of the face mask emoji, the establishment, owned by Tim Kortuem, is also offering toilet roll shaped cakes.

A nod to the well-documented toilet paper shortage that's occurred across the world as consumers frantically buy up huge quantities, the marble

In Hanoi, Vietnam, a chef at Pizza Home has created a coronavirus-themed burger.

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cakes are wrapped in white fondant etched with tiny diamond shapes in the style of quilted toilet roll.

The novel cakes were an instant hit with customers, and the team at the bakery, situated in the city of Dortmund in Germany's North Rhine-Westphalia region, are currently making at least 200 a day.

In fact, Kortuem told [Reuters Television](#) the toilet roll cakes are helping to keep the Schuerener Backparadies in business during these difficult times.

"The customers are totally crazy about it," he says. "Most people just like it as it adds some fun to these times."

Like France, and many countries around the world, Germany has imposed extensive restrictions and many non-essential businesses have been forced to close.

However, restaurants and eateries that offer food delivery and pick-up are allowed to remain open.

Over in the US, a New York doughnut shop has dedicated its latest offering to infectious disease expert Dr. Anthony Fauci, a member of President Donald Trump's coronavirus task force who's won the public over with his straight-talking approach.

The team at Donuts Delite in Rochester decided to make Fauci the "face" of one of its doughnuts as a way of lifting the mood.

"We wanted to find a way to cheer up the people in our neighborhood," owner [Nick Semeraro](#) told [CNN](#).

The team were impressed by Dr. Fauci's handling of the situation so far.

"We loved his message and how thorough he was, and how he kept everyone informed during the crisis ... so we wanted to give back and say thanks."

According to Semeraro, the shop has sold thousands of the buttercream-frosted doughnut, which features Fauci's face printed on edible paper, with customers asking for the treat to be sent to various cities and states.

"We had no idea it was going to blow up this big," he said. "We didn't know everyone else felt the same way we did."

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There's no word on a coronavirus-themed pizza yet, but we suspect it won't be far off.

[edition.cnn.com](#), 27 March 2020

<https://www.edition.cnn.com>

Heirloom plants: Saving the nation's seeds from extinction

2020-03-28

The battle of the Somme in 1916. A British soldier fighting in France is given seeds as a memento of happier times. When he returns home, he plants them in the soil. His family and friends carry on the tradition, and, today, you can still find the Blackdown Blue pea growing somewhere in Somerset.

Catrina Fenton, head of the Heritage Seed Library in Coventry, rests the seeds in her hand. "People like to grow something that's got a bit of history behind it," she says. "A lot of the varieties in our collection have got wonderful stories; they relate to a particular place, or they taste a bit like the tomatoes their grandfather used to grow."

She shakes black and cream beans from another envelope on to her palm. Legend has it that seeds of the Brighstone bean were salvaged from a shipwreck off the Isle of Wight. "Nobody can quite agree what century that happened. But, because those seeds were then in the hands of the local population, they continued to grow them for generation after generation and therefore it's been associated with that particular place and time, which is really rather charming."

Catrina has an encyclopaedic knowledge of the hundreds of curious-sounding vegetables that have been grown locally for centuries. The seeds of these heirloom, or heritage plants, are conserved at their facility near Ryton. Part seed library, part museum, part botanical garden, the organisation distributes seeds to members interested in helping to save local plants at risk of disappearing.

"The seeds that we're distributing to our members we know has been grown in the UK in UK-growing conditions," says Katrina. "And, of course, that's not necessarily the case for your standard packet of seeds. You might not know where they come from but the vast majority of seeds may well be imported from other countries and that provenance of where your seeds come from I think is as important as your food."

Legend has it that seeds of the Brighstone bean were salvaged from a shipwreck off the Isle of Wight.

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Named after Uncle Joe

When I visit early in the year, brown envelopes of seeds sit in pigeon holes waiting to be posted out to members. Black jack kale is lined up next to purple podded best, Ray's butter bean, giant stringless and parfree's dragon. The oldest variety in the collection, a kind of field bean, was first recorded in 1293. Others have connections with local places and people. "Their [true] names have got lost in the midst of time and they're now named after Uncle Bert or Aunty Madge or Uncle Joe or something like that," says Catrina.

There's no strict definition of a heritage variety, but the plant must be pollinated naturally, with pollen spread from one plant to another by insects or the wind. In one of the polytunnels, the heads of leeks poke up out of the soil. Catrina explains how later in the year, a beautiful flower head will appear, which will be pollinated to produce seeds.

The seeds will carry the parents' genetic material, which will be passed faithfully down to future generations. In contrast, most commercial seeds are F1 hybrids deliberately created by crossing two different parent varieties. Saved seeds may not germinate and if they do, the new plants will not breed true. "A big important part of what we do is to make sure that we conserve by continuing to grow varieties that might otherwise be lost," explains Catrina.

The rise of seed swapping

You can still find a few heritage varieties on sale in supermarkets, such as little gem lettuce, which has been cultivated for more than a hundred years. Many, though, have disappeared from the shelves. Today, three companies control about half of all seeds grown on the planet, many of which are patented.

As a reaction against the increasing control of the supply of seeds by a handful of large companies, local seed swapping events have sprung up. The biggest such event is Seedy Sunday, which takes place in Brighton every year.

"The idea is to get people to grow and to keep their own seeds and to then swap their excess with other people," says Ros Loftin, who has been a committee member for 10 years. "When I started going to Seedy Sunday just to swap or to get some local seeds it was, shall we say, quite an alternative event, whereas now there seems to be quite a few youngsters

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who come, and families. They have a window box or they have a little bit of a back garden and they would like to grow some food or some flowers."

This year, she is growing no less than 32 varieties of heritage tomatoes at her two allotments. "I try and keep some of the old ones that date back to the 19th Century for historical reasons, and also for taste and colour," she says, pointing out that as well as saving varieties from the past that might otherwise no longer exist, heritage plants are important in a changing world. "The fact that the plants are different allows some degree of adaptable resistance to disease and stress," says Ros. "That's where the seed exchanges are important because they are local events. They bring back to the locality the different varieties that are adapted."

Catrina Fenton echoes her views. "We know anecdotally and also with our work looking at some of these varieties more specifically that they will have certain resistances and resiliencies, whether it's environmental or pests and diseases, that of course are going to be really important to us as a genetic resource particularly under the challenges of climate change, for example."

Before I leave, I ask her a particularly tricky question. Which is her favourite variety in the collection? She settles on the angel bean, with its distinctive mottled seeds, which was traditionally eaten at Christmas time. "This an old German variety where they took the pods off, podded them around Christmas time - to reveal, with a little bit of imagination, a little angel on each of the seeds. There's a whole load of reasons why people save seeds, including how beautiful the seeds look."

bbc.com, 28 March 2020

<https://www.bbc.com>

An Army of Hungry Ducks Keeps This Historic South African Vineyard Pest-Free

2020-03-23

Earlier this year, thousands worldwide were miffed to learn that social media rumors of a locust-eating army of ducks, purportedly set to protect Pakistan from pests, were false—but not all bird-based cavalries are fake news.

For nearly four decades, South Africa's Vergenoegd Löw the Wine Estate has been deploying a daily parade of waterfowl more than 1,200 strong to

Should any troublesome six-legged creatures show up at the vineyard, the ducks will generally snap those up, too, feasting even on mosquito larvae.

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keep their snail and insect population in check, Ulrike Lemmin-Woolfrey reports for *Atlas Obscura*.

The approach helps remove snails and bugs from the establishment, which opened in 1696, without the need for harsh chemicals that could damage the environment. "We try to keep a pesticide-free farm by using the ducks," Denzil Matthys, Vergenoegd's duck caretaker, told NPR's Sarah Birnbaum in 2016. "They help us not to use poison on the farm."

Each morning, around 7 a.m., the vineyard's horde of Indian runner ducks—a fast-jogging but flightless breed of domestic duck—awakens from their slumber. By about 10:30 a.m., they've crossed through the gate separating their residence from the vineyard and start scarfing down pests galore. Situated near the ocean, Vergenoegd's plot of land is plagued by an abundance of white dune snails, which love to feast on the buds sprouting off grape vines in spring. Picked clean, the plants would no longer be able to produce fruits necessary for the vineyard's signature shiraz, merlot, malbec and cabernet sauvignon wines, among others.

Aided by their agile bodies, long necks and sharp, quick beaks, the birds can pluck snails from vines and trunks, wriggling between rows of plants with an indefatigable spirit. "The Indian runner duck is the best worker in the vineyard," Matthys told NPR.

Should any troublesome six-legged creatures show up at the vineyard, the ducks will generally snap those up, too, feasting even on mosquito larvae. Gavin Moyes, the estate's tasting room manager, notes that the birds also bring their benefits full circle: Their nutrient-rich dung "helps our vines grow," he tells *Atlas Obscura*.

This unusual strategy has precedent in Bali, where ducks are regularly dispatched to fertilize rice paddies before seeds are planted, and in China, where officials once released thousands of ducks and chickens to combat a swarm of locusts laying waste to agricultural plots. According to some reports, ducks are hungrier than their chicken coworkers, and are capable of consuming up to 200 locusts a day.

At Vergenoegd, which started using ducks in 1984, feathered workers enjoy certain privileges. To keep the birds' concentration focused on the job at hand, the vineyard's owners maintain a small but fierce team of geese, who guard their feathered comrades from mongoose, owls and other predators.

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The ducks' day ends around 4 p.m., when human herders wave them back into formation with flags, according to NPR. Obliging as ever, the birds will shuffle in an orderly fashion back to their home: a series of small colonies, scattered around the estate's lake.

In an interview with *Atlas Obscura*, Moyes is careful to mention that the ducks are not turned into a menu item when they retire: "That would be like eating your colleagues," he says.

When their appetite and physical stamina begin to wane, the ducks lounge on the lake's island for the rest of their days.

smithsonianmag.com, 23 March 2020

<https://smithsonianmag.com>

Can I get the coronavirus twice?

2020-03-25

There have been a few stories in the press of people apparently being re-infected by the coronavirus SARS-CoV-2. These people reportedly became infected and hospitalised, and then were sent home once they'd tested negative for the virus. Then, days or weeks later, they tested positive again.

But this doesn't necessarily mean that they caught the coronavirus twice.

First, during recovery from infection, a person may have very low amounts of the virus remaining in their body – low enough that our tests can't accurately detect it. In this case, the person may be sent home on the assumption that they're virus-free. However, their body may still be fighting the virus, and a resurgence of the virus (and symptoms) can occur, resulting in a positive test. In this case, it would just be one protracted infection, not a re-infection.

Second, we know that in most people, SARS-CoV-2 generates a strong response from the immune system. With the related coronavirus SARS-CoV, this response creates an immune memory of the virus that prevents re-infection for one to two years, and it's likely that this is also the case for the new virus. SARS-CoV-2 also has a fairly low mutation rate, which means that it (hopefully) won't change enough that our immune system no longer remembers it (this is what the flu virus does and why we need a new jab every year).

If this all turns out to be true, then it would suggest that re-infections are unlikely and that the cases in the news reflect testing sensitivity. However,

But this doesn't necessarily mean that they caught the coronavirus twice.

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SARS-CoV-2 is so new that we won't know for sure until we've found out just how protective our immune response to the virus is, and how long it lasts.

sciencefocus.com, 25 March 2020

<https://www.sciencefocus.com>

Farms lead to gut bugs swapping

2020-03-28

How does a livestock farm's environment change farmworkers' gut microbiomes? To answer that question, a group led by Ya-Hong Liu and coworkers at the South China Agricultural University in Guangzhou examined how gut microbiomes changed in 14 male veterinary students during 3-month internships at several large-scale pig farms in China (*Nat. Commun.* 2020, DOI: 10.1038/s41467-020-15222-y). The team compared fecal samples from the students before, during, and after their internships, as well as samples from long-term workers at those farms and from the farm environments themselves. Genetic sequencing of the bacteria in the students' samples showed that the students picked up bacteria from the environment during their time at the pig farms, making their gut microbiomes more similar to those of long-term farmworkers. And because the pigs are on antibiotics, some of the bugs that transferred to the students carried antibiotic-resistance genes. Six months later, the guts of the students had mostly recovered. Even so, the researchers say that the transfer of antibiotic resistance from bacteria on the farm to bacteria in the human gut could be a risk for workers who stay on farms for long periods.

cen.acs.org, 28 March 2020

<https://www.cen.acs.org>

And because the pigs are on antibiotics, some of the bugs that transferred to the students carried antibiotic-resistance genes.

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ENVIRONMENTAL RESEARCH

[Selective isolation of agents of chromoblastomycosis from insect-associated environmental sources](#)

[An indoor study of the combined effect of industrial pollution and turbulence events on the gut environment in a marine invertebrate.](#)

[Occurrence of caffeine in the freshwater environment: Implications for ecopharmacovigilance](#)

[Characterization and comparison of groundwater quality and redox conditions in the Arakawa Lowland and Musashino Upland, southern Kanto Plain of the Tokyo Metropolitan area, Japan](#)

[Signaling pathways of oxidative stress in aquatic organisms exposed to xenobiotics](#)

CHEMICAL EFFECTS

[Arsenic induces transgenerational behavior disorders in *Caenorhabditis elegans* and its underlying mechanisms](#)

[Effects of Brominated and Organophosphate Ester Flame Retardants on Male Reproduction](#)

[In-vehicle carbon dioxide and adverse effects: An air filtration-based intervention study](#)

[Iodine and bromine in fish consumed by indigenous peoples of the Russian Arctic](#)

PHARMACEUTICAL/TOXICOLOGY

[Serum Metabolites in Hand-Arm Vibration Exposed Workers](#)

[Estimating inorganic arsenic exposure from rice intake in Chinese Urban Population](#)

[Effect of fructose and its epimers on postprandial carbohydrate metabolism: A systematic review and meta-analysis](#)

[Human in vitro percutaneous absorption of bisphenol S and bisphenol A: A comparative study](#)

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The dog as a sentinel species for environmental effects on human fertility

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Knowledge and attitude among Lebanese woman towards hazardous chemicals used in nail cosmetics

Occupational exposure to secondhand cannabis smoke along law enforcement officers providing security at outdoor concert events

Demonstration of subclinical early nephrotoxicity induced by occupational exposure to Silica among workers in pottery industry

Cobalt-containing dust exposures: Prediction of whole blood and tissue concentrations using a biokinetic model

Respirator usage protects brain white matter from welding fume exposure: a pilot magnetic resonance imaging study of welders

Environmental monitoring of PAHs exposure, biomarkers and vital status in Coke oven workers