The COVID-19 pandemic has changed the reality we live in. From planning scenarios and trends to preventing future pandemics, we are in a deluge of information. As organisations working towards the shared 50by40 goal, we all want to ensure that any public statements, blogs, and articles we put out are backed by strong data points that are both easily understandable and based on good science.

These factsheets are an attempt to aid partner organisations and allies in doing exactly that. We hope these act as a common resource for a diverse communication needs, from creating social media posts to backing policy briefs.

It is important to note that these factsheets are a product of research as well as facts added by partner organisations. They do not in their entirety represent the view held or endorsed by 50by40 or all of its partner organisations. Different organisations have different ideas for the solutions to the broken food system, so not all points will be relevant or appropriate for all organisations. The factsheets hope to represent the diversity of views held and endorsed by different partner organisations. To summarise, it is our effort and hope that all organisations find some facts of value, even if their organisational stance does not agree with all facts mentioned in the ‘Usage’ section.

We at 50by40 hope this document serves as a helpful tool in all of your COVID-19 communication endeavours and beyond.

Usage

Most factsheets have two parts, general facts and commentary. Facts are stated first, followed by a separate headline for commentary. There are sections that only include facts, or only include commentary, or both.

General facts include scientific information, building the case for the topic at hand.

Commentary includes expert opinion, that is mostly backed by scientific data or refers to common knowledge.

In terms of usage, please be sure to link any fact that is used to appropriate resources (which are listed in the footnote for each point). If possible, take the time to elaborate and back references with other compelling data points, especially when using data from commentary.
“Examples of livestock production, particularly cattle grazing, directly interacting with wild species are numerous and date back several decades (Taylor, 1986; Knapp & Matthews, 1996). Livestock grazing has long been known to lower population densities for a wide variety of taxa, disrupting nutrient cycling, altering freshwater systems and changing ecological community organisation (Fleischner, 1994).” -Greenpeace

Less is More Scientific Background

- Expansion of agriculture promotes encroachment into wildlife habitats, leading to ecosystem changes and bringing humans and livestock into closer proximity to wildlife and vectors, and the sylvatic cycles of potential zoonotic pathogens. This greater intensity of interaction creates opportunities for spillover of previously unknown pathogens into livestock or humans and establishment of new transmission cycles. Anthropogenic environmental changes arising from settlement and agriculture include habitat fragmentation, deforestation, and replacement of natural vegetation by crops. These modify wildlife population structure and migration and reduce biodiversity by creating environments that favor particular hosts, vectors, and/or pathogens.

- ‘Intensification of livestock production, especially pigs and poultry, facilitates disease transmission by increasing population size and density, although effective management and biosecurity measures will mitigate the between-herd spread of zoonotic diseases, such as brucellosis and tuberculosis. As an alternative to investing in improved husbandry or in situations of poor animal health service provision, antimicrobials are often used for growth promotion, disease prevention, or therapeutically, which in turn promotes the evolution of antimicrobial resistance in zoonotic pathogens. Intensification also requires greater frequency of movement of people and vehicles on and off farms, which further increases the risk of pathogen transmission.’

- ‘The first known outbreak of Nipah virus occurred in Malaysia during 1998–1999, causing respiratory disease in pigs and high case fatality in humans. Epidemiological outbreak investigation showed that pig and human cases had occurred in 1997 on a large intensive pig farm in northern Malaysia, where Nipah virus–infected fruit bats were attracted to fruit trees planted around the farm. This provided the opportunity for virus spillover to susceptible pigs via consumption of fruit contaminated with bat saliva or urine. Respiratory spread of infection between pigs was facilitated by high pig and farm density and transport of pigs between farms to the main outbreak area in south Malaysia. Pigs then acted as amplifier hosts for human infection. Almost all human cases had contact with pigs; there was no evidence of direct spillover from bats to humans or of human-to-human transmission.’
Pathogens tend to be amplified in animals raised in CAFOs and, thus, are more difficult to eliminate in meat packing processes. Recent outbreaks in Asia have shown that transmission of infectious agents can arise from small farms raising poultry in proximity to domiciles and to other animals. However, because CAFOs tend to concentrate large numbers of animals close together, they facilitate rapid transmission and mixing of viruses. There is a concern that increasing the numbers of swine facilities adjacent to avian facilities could further promote the evolution of the next pandemic.

'Animals held in confinement produce large amounts of waste, which need to be disposed of. Much of this waste, which may contain large quantities of pathogens, is disposed of on land, posing an infection risk for wild mammals or avians. Poultry house waste is also utilized in aquaculture, a form of food animal production, which results in the creation of artificial wetlands and thereby increases direct opportunities for contact with wild avians.'

Commentary

“What was extremely interesting from the start, but isn’t discussed so much now, is why we humans can get this virus at all. It’s a matter of human expansion. We’ve become too numerous, and take up too much space. We humans exploit animals and nature. So we get not only meat and milk, but also strange viruses. This ought to be given more attention”. - Björn Olsen, Professor of Infectious Diseases, Department of Medical Sciences, Uppsala University 11th March 2020

We are witnessing increasing globalization, with persons, animals, and their products, moving around the world. This movement enables unprecedented spread of infections at speeds that challenge the most stringent control mechanisms.

Andrew Cunningham, Professor of Wildlife Epidemiology at the Zoological Society of London: “The underlying causes of zoonotic spillover from bats or from other wild species have almost always -- always -- been shown to be human behavior," said Cunningham. "Human activities are causing this." When a bat is stressed -- by being hunted, or having its habitat damaged by deforestation -- its immune system is challenged and finds it harder to cope with pathogens it otherwise took in its stride. "We believe that the impact of stress on bats would be very much as it would be on people," said Cunningham. "It would allow infections to increase and to be excreted -- to be shed. You can think of it like if people are stressed and have the cold sore virus, they will get a cold sore. That is the virus being ‘expressed.’ This can happen in bats too." - CNN 2020
Kate Jones, Chair of Ecology and Biodiversity at University College London: "It’s not OK to transform a forest into agriculture without understanding the impact that has on climate, carbon storage, disease emergence and flood risk," said Jones. "You can’t do those things in isolation without thinking about what that does to humans." - CNN 2020

Diseases like coronavirus could be here to stay, as humanity grows and spreads into places where it’s previously had no business. Changing human behavior is an easier fix than developing a vastly expensive vaccine for each new virus. "There are tens of thousands [of viruses] waiting to be discovered," Cunningham said. "What we really need to do is understand where the critical control points are for zoonotic spillover from wildlife are, and to stop it happening at those places. That will be the most cost-effective way to protect humans." - CNN 2020

“A high density of livestock is a challenge, because if a pathogen does jump from the forest into those livestock, it can spread very readily," “Pathogens spread much better when their hosts are at high density. That’s what COVID is doing right now.” Felicia Keesing, ecologist and educator, Bard College, New York.

5 - https://www.pnas.org/content/pnas/110/21/8399.full.pdf
6 - https://www.pnas.org/content/pnas/110/21/8399.full.pdf
7 - https://www.pnas.org/content/pnas/110/21/8399.full.pdf
8 - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1817683/
9 - Ibid.
12 - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2874344/