Title: Chicken Curry in the Time of COVID-19: The Industry of Bugs and Drugs

Author(s): Assa Doron and Alex Broom


ISSN (Online): 2349-8846

Published by: Economic and Political Weekly (Engage)

Article URL: https://www.epw.in/engage/article/chicken-curry-time-covid-19-industry-bugs-and

Author(s) Affiliation: Assa Doron (assa.doron@anu.edu.au) teaches anthropology at the College of Asia and the Pacific, the Australian National University. Alex Broom (alex.broom@sydney.edu.au) is a sociologist and the Director of the Sydney Centre for Healthy Societies, the University of Sydney.

Articles published in EPW Engage are web exclusive.
Chicken Curry in the Time of COVID-19: The Industry of Bugs and Drugs

Assa Doron and Alex Broom

Abstract: The COVID-19 pandemic seems to have had its beginnings in China, spreading globally to devastating effect. It subsequently laid bare the underlying vulnerabilities of many previously prosperous and technologically advanced economies and societies. The pandemic has also begun to reveal the curious ways in which microbes and their evolving activities are intrinsically tied to our way of life: from individual consumer habits and damaging environmental practices to the unstable global supply chain and the pathogens prevalent in the food and drug production industry. Microbes, it is evident, do not work alone; they rely on multiple others in a vast network of humans and animals in order to thrive. India’s emerging livestock industry, and especially its booming factory farming sector, is at risk of further compounding the spread of these pathogens and future outbreaks. In this paper, we will discuss key concerns around the relationship between the current pandemic (and potential future ones) and the drug and livestock industry in India and beyond.

A friend from Delhi was about to throw a small surprise party for his wife’s birthday. He called up the caterer to discuss the menu; he wanted chicken curry. The caterer responded, “Are you sure you want to order chicken? Your guests might not want it!” This had nothing to do with concerns about vegetarianism. Indeed, stereotypes aside, surveys suggest that Indians have a varied diet and meat consumption is very much on the rise (Natarajan and Jacob 2018). The caterer was referring to a recent outbreak of bird flu across India, which led Delhi’s municipal authorities to declare a ban on the sale, processing and storing of poultry meat and eggs (NDTV 2021).

“Okay,” the friend said, “make it fish curry instead.”

Bird flu and COVID-19 have something in common: both are zoonotic diseases. For decades
epidemiologists have warned of the “zoonotic spillover,” whereby pathogens jump from animals to humans. So, when COVID-19 struck, the cause was a familiar one. In fact, a recent United Nations (UN) report points out that “60 percent of known infectious diseases in humans and 75 percent of all emerging infectious diseases are zoonotic” (UN 2020: 4).

The coronavirus crisis, and its zoonotic origins, has focused our collective attention on the “exotic”—wet markets in China and wildlife smuggling—rather than the tamer, though equally dangerous area of industrial food production (Doron 2021). The specific cause of coronavirus jumping from animal to human and the circumstances in which this occurred continue to generate heated debate, with ongoing investigations by World Health Organization (WHO) scientists. The immediate global crisis is far from resolved. Nevertheless, this is also a moment to pause and consider the precursors to a “zoonotic spillover” of this scale.

One area of concern centres on booming, and loosely governed, global dairy and livestock industries, their escalating, long-term effects on the environment, and the spread of zoonotic pathogens. In the past, outbreaks like the swine flu, Q-fever, Nipah virus (NiV) and so on, were linked to industrial food production and its effect on ecological systems (Jones et al 2013; UNEP 2016). Whether the coronavirus jumped via a much-maligned pangolin or a humble bat does not matter as much as the process leading up to the “zoonotic spillover,” which is as important to understand as is its devastating outcome—a viral outbreak.

As anthropologists Lynteris and Fearnley have recently argued, the massive scale and spread of factory farming across Asia, and China in particular, came at the expense of rural farmers. Many were forced into new geographical terrains in search of livelihood, including farming creatures captured from the wild (Lynteris and Fearnley 2020). Measures by governments worldwide to increase world food supplies by 2030 have been said to represent a significant opportunity for farmers in rural areas, but with the risk that smallholders may be squeezed out of markets as production intensifies and becomes centralised (Robinson and Pozzi 2011). At the same time, such intensification of meat-based food production carries escalating environmental and public health risks associated with this poorly regulated sector of growth.

With many Indians consuming different kinds of meat, and the well-established presence of wet markets, it is imperative to investigate how wet markets are run (Goyal 2020). Equally important, however, is to scrutinise how meat-related food chains are organised and the long-term impact on health and economic security. In fact, worldwide, the demand for food is sparked by an increased demand for meat-based protein, rather than increasing populations (Robinson and Pozzi 2011; McKenna 2017). The dairy and meat industries are not only in part responsible for a rise in greenhouse gas emissions, but have driven human penetration into uncultivated ecozones, where bats or other wildlife and their viral companions roam free. Food supply chains are intimately connected to changing land use, labour relations and the increase of zoonoses (Quammen 2012; Chakrabarty 2020).
If global meat consumption remains constant until 2030, for example, only 5% of the projected increase in demand for food would occur. Urbanisation is also a key factor in driving rates of consumption, with twice the rate of growth expected in India’s urban areas as compared to rural areas. The record boost in consumption of foods sourced from animals will occur in cities with the highest rates of population growth, so consumption is indexed to population through urbanisation. Curiously, higher income countries, featuring an increasingly varied diet of animal protein, are experiencing a movement towards reduced meat consumption (Robinson and Pozzi 2011). Meat consumption is reported to have decreased globally, primarily due to the recent outbreak of African Swine Fever in China in 2019. Nevertheless, past trends and future projections all point to livestock as one of the fastest growing sectors in agriculture globally (OECD 2020; World Bank 2019).

Put simply, the origins of the accelerated spread of pathogens are intimately related to our modern living arrangements which are in turn tied to the food industry and its displacement of people and damage to ecosystems (Jones et al 2013). This is compounded by the harmful methods deployed in factory farming and big agriculture. For instance, the avian and swine flu pandemics are widely considered to have been caused by big agribusiness-intensive livestock practices (UN 2020). Selection and breeding methods reduced genetic diversity in factory farms, enhanced contact opportunities and fuelled stress induced immune suppression (Silbergeld 2019). In such environments, virulent microbes thrive, and farmers become increasingly reliant on antibiotics and growth promoters to keep animals from becoming sick in intensive conditions (SumOfUs 2015; Collen 2015).

Once pathogens emerge, they move fast across bodies and continents via global supply chains of trade and food distribution, where they resurface at different places, on our plates in mutated forms, leading to outbreaks. This is likely what caused the outbreak of bird flu in India in mid-January 2021.

**Planet of the Chickens**

The high level of chicken consumption in India is part of a global phenomenon. “We are living on the planet of the chickens,” write researchers from the University of Leicester, “The broiler (meat) chicken now outweighs all wild birds put together by three to one” (Bennett et al 2018).

Consider that the rise of the chicken to planetary dominance could only be achieved through drug-fuelled industrial production. From the earliest days of the antibiotic era, pharmaceutical agents have been used in animals that are grown for food. Eighty percent of the antibiotics sold in the United States and more than half of those sold around the world are used in animals and not in humans. Animals destined to be meat routinely receive antibiotics in their feed and water, and most of those drugs are not given to treat diseases, but rather prophylactically.
Antibiotics are given to make food animals grow faster and increase weight (McKenna 2017).

Consider the performance enhancing drugs taken by elite athletes, a method known as the non-therapeutic usage of drugs. Similar is the case with antibiotics administered to animals. The key problem with the overuse/misuse of antibiotics in the livestock industry is that the bacteria evolve and develop resistance against antibiotics, sometimes rapidly. Alexander Fleming warned us early on of this phenomenon called antimicrobial resistance or AMR. Few paid attention to this warning back in the golden days of antibiotics. These days bacteria increasingly thumb their nose at even the most potent of antibiotics thrown at them. These microbes are popularly known as superbugs.

India is already considered a major epicentre of the global AMR crisis, with unprecedented antimicrobial consumption, production, and misuse. Hospitals struggle to contain the spread of increasingly resistant bacteria. Appealing to citizens to be responsible in their use of antibiotics is having limited effects. The Indian Prime Minister has tried to do so on his popular radio programme, Mann ki Baat, where he discussed the “serious crisis of AMR” (Modi 2016). This is especially difficult to manage in India where antibiotics are so widely available at pharmacies and from other paramedical services (Broom and Doron 2020). At the same time, superbugs continue to multiply and exploit the weak links of factory farming, spreading disease in the crowded confines of an already immune-compromised environment. Animals and humans are thus implicated in a complex system that renders them both vulnerable to infectious diseases which can be fungal, bacterial or viral in nature (Doron and Broom 2019).

Local Chickens and Commercial Farms

The spectre of zoonotic diseases reminds us of the urgent need for a more sustainable, ethical and healthy food supply chain in the beef, pork, dairy, aquaculture and poultry industries.

People across the world are increasingly aware of the inhumane and dangerous practice of factory chicken farming, with some countries banning antibiotics as growth promoters. In the Netherlands, these antibiotic supercharged chickens are known as plofkit, literally meaning “exploding chicken”, referring to the unnaturally speedy process of growth or swelling of the birds. Most Dutch supermarkets no longer stock the plofkit—typically the Ross or Cobb breeds—a result of successful animal rights campaigns (Neilson 2016).

During a visit to India’s burgeoning chicken farms in January 2020, as part of a collaborative research project on AMR in the region, we observed prolific use of antibiotics. Breeds varied but the fast-growing Cobb was becoming increasingly popular. Mega chicken-processing companies were encouraging farmers to invest, offering equipment, vaccines and medicines, veterinary care and the works. Poultry was everywhere a more affordable option than other types of meat.
And yet, we were also told that when it came to ritual offerings in temples and festivals, it was the more expensive country chickens that were preferred (*desi murgh*). The commercial factory farmed chickens (broilers) were considered weak and feeble, unbecoming of divine consumption.

The Government of India is explicitly supporting broiler production, recommending intensification of farming methods. A national action plan for the poultry industry advocates intensification methods, such as the production of 500 eggs in 100 weeks compared to the present 320+ eggs in 72 weeks. It advocates a large increase in vaccine doses to help cope with the possibility of disease (MOAFW 2017: 28). The objective is to double farmers’ income to meet growing demand for protein rich food, and to achieve 2% of the world egg market through exports. This will require, for example, rearing an additional 1,840 million broilers between 2016 and 2022 (MOAFW 2017: 32). No mention is made of antibiotics as growth promoters or AMR. Even the SWOT analysis offered for the whole poultry sector does not mention AMR or antibiotic use; strangely, the only threat described, apart from specific diseases, is “calamity” (MOAFW 2017: 14). This alarming reticence is continued in a companion report addressed to the dairy industry, where AMR is nowhere mentioned (MOAFW 2018).

Similarly, a report from the government’s pharmaceutical wing makes no reference to AMR (MOCF 2017), and scans through subsequent annual reports reveal the same trend (MOCF...
These reports to industry are strikingly different to a report on an inter-ministerial review meeting on AMR, published in collaboration with WHO, where the full gamut of concerns about AMR are outlined (MoHFW and WHO 2016). At the very least, such disparity suggests a lack of coordination in efforts to combat AMR by the government.

The Centre for Science and the Environment has produced successive reports confirming the prolific use of antibiotics in the chicken industry in India. One study observed “the presence of six antibiotics widely used in poultry—oxytetracycline, chlortetracycline and doxycycline (from class tetracyclines); enrofloxacin and ciprofloxacin (from fluoroquinolones) and neomycin, an aminoglycoside” (Paliwal and Singh 2014). Others point to the use of colistin, an antibiotic seldom used in humans due to its toxic properties, but commonly given in animal feed and particularly poultry (Khullar 2019). Nevertheless, colistin has become one of the most valuable and potent antibiotics we have left in the arsenal against multi-resistant organisms (Davies and Meesaraganda 2018). Following many countries across the world, including China, India has recently announced a ban on colistin for use in animals. This is precisely because of its now enormous value as a last-resort antimicrobial for human health, but also the known risks of antimicrobials given as growth promoters in animals. Yet, several animal pharmaceutical companies continue to advertise their products on the web, which contain colistin as growth promoters.

There is a clear cause and effect relationship here. The more antibiotics are used for non-therapeutic purposes, the less potent these drugs become for preventing and treating bacterial infections in humans and animals alike. While antibiotics are only effective against bacteria, they are critical for dealing with pandemics.

**Big Pharma, Antibiotics and the COVID-19 Pandemic**

In an article from 2008 in the *Journal of Infectious Diseases*, the then less known Anthony Fauci co-authored a paper about the 1918 Spanish flu pandemic, observing that many of the fatalities were caused by secondary bacterial infections. That is, once the virus weakens the immune system, opportunistic bacteria take over and invade the lungs, with lethal effects. Fauci and colleagues concluded that while the next pandemic is likely to be viral, it is those deadly secondary infections that we must be worried about. They recommend that “the stockpiling of antibiotics and bacterial vaccines should be among the highest priorities in pandemic planning” (Morens et al 2008: 962).

But stockpiling antibiotics may be of little help when the drugs themselves are losing their efficacy. And developing new, more effective antibiotics makes no commercial sense. In a world where the free market is the ultimate arbiter, it is the more lucrative drugs used for treating chronic diseases that generate revenues. Antibiotics, with their short-term application—and potential to be made ineffective through resistance—are simply not profitable.
These miracle drugs are now outsourced to Asia for manufacturing—mainly China and India—where they can be produced cheaply, cutting costs on labour and evading environmental regulations. The consequences of this practice are devastating.

In India, in particular, scientists have found that multinational drug factories pollute with impunity, discharging toxic chemical effluents into land and water, contaminating the environment with active pharmaceutical ingredients. This pollution also leads to the emergence of multi drug-resistant organisms, known as superbugs (Doron and Jeffrey 2018; Lübbert et al 2017).

One of the problems is that pharmaceutical companies are not required by law to disclose the names of third-party manufacturers. In a survey of 30 of the world’s largest and most active pharmaceutical factories, only one disclosed its third-party sources (Access to Medicine Foundation 2018). This is an important factor in bringing accountability to risk management for the environment, especially since the third-party companies are often suppliers of active pharmaceutical ingredients (APIs) (Changing Markets and Ecostorm 2016).

While India and China are cited as the leading manufacturers of antibiotics, China now produces 80% to 90% of APIs, often in facilities with atrocious track records of pollution. India is one of the largest producers of generic drugs around the world, but while they are produced in India, the APIs are predominantly sourced from China (Dhar and Rao 2020). These Chinese companies’ products are networked with important global pharmaceutical suppliers. Yet, a shocking lack of transparency pervades the supply chain (SumOfUs 2015). Similarly, in India, small, specialised producers of APIs are common. As an example, a 2016 independent report states, “little is known about Asiatic, Drugs and Pharmaceuticals Ltd.” Such companies supply much larger companies with ingredients that are used to make finished products, and “this makes identifying all actors in the supply chain for a given medicinal product a near-impossible task, even for regulators” (Changing Markets and Ecostorm 2016: 21).

As long as cheap drugs kept flowing through the supply chain everything seemed fine. But then COVID-19 struck, and factories in China and India were shut down for months. Antibiotics were in short supply, with some countries stockpiling the drugs and further compounding the problem (Tong 2020). The implications were fatal.

An early study of nearly 200 COVID-19 patients in Wuhan, discovered that 50% had developed a secondary bacterial infection (Zhou et al 2020: 1057). In a study of 99 COVID-19 patients in Wuhan, 71% had been treated for bacterial infection (Chen et al 2020: 509); and in another study of just over 50 patients in Wuhan the rate was 94% treatment for bacterial infection (Yang et al 2020: 478). These trends indicate that bacterial infections are common complications of COVID-19, and persist alongside a critical reliance on antibiotics for their treatment. Fauci’s warning about secondary infections should be heeded.
COVID-19’s fatality rates may be closely linked to other bacterial infections that our existing antibiotics can still cope with, though this is becoming much harder as superbugs proliferate (McCarthy 2020). Perhaps now that we face an empty cupboard of antibiotics, we will be forced to rethink the food and drug supply chains on which we have come to rely. This might also mean friends in India can go back to safely eating eggs and chicken curry, whether at home, in a restaurant or street side stalls.

Policy and Practice

Beginning in late 2020 and continuing into the New Year, hundreds of thousands of poultry were killed to try and fend off bird flu outbreaks across India. These represent temporary solutions at best, and ones that are immensely costly (Kukreti 2021). To prevent future outbreaks of ever mutating variants of Avian influenza and the concomitant rise of drug resistant pathogens, the authorities must act with long-term, preemptive solutions in mind, both at the central and state level. A coordinated strategy is vital and should include collaborative projects that join Non-Government Organisations (NGOs), farming associations, industry stakeholders with expert, scientific evidence and advice.

Successful policy interventions will need to do a range of things in order to break down current barriers to enacting change. These changes must cut across the food and livestock sectors, and convey a consistent and coherent message about the need for judicious use of pharmaceuticals. They will need to accommodate both punitive and positive consequences for policy non-compliance and adherence respectively. This necessarily involves governments’ ensuring that the producers can comprehend and convey the positive benefits of judicious use of medicines (to workers and consumers), rather than merely focusing on ramping up surveillance and restrictions of pharmaceuticals.

A clear lesson from international policy and practice interventions is that negative and punitive campaigns in relation to optimisation of antimicrobial use in animal and human health and agriculture do not work. Strategies which promote healthy, sustainable practices (in relation to both environment and medicines) and which encourage livestock diversity should be promoted and farmers actively rewarded for cutting out or significantly reducing antibiotic use from their practice.

Some progress has clearly been made in collaboration and in offering a unified policy response. For example, the Delhi Declaration for multisectoral action on AMR was finalised in 2017 and supported by 12 ministries, including health, environment, agriculture and food (Government of India 2017). Promises of inter-ministerial collaboration have been made (see Chaudhry and Tomar 2017: 2634–35). However, although a number of initiatives have been developed from the strategic objectives of this plan, their effectiveness and the extent of their implementation remain unknown (Gandra et al 2017). As a specific example, the Food Safety
and Standards Authority of India announced a directive to limit the use of antibiotics as growth promoters, but without giving any indication of how this initiative would be monitored (Kakkar et al 2017: 28).

In the end, it is multisectoral action with clear accountability structures that is required to combat AMR (WHO 2017), and not just declarations or even policies. Repeatedly, the literature reflects a paucity of information on how initiatives will be regulated or assessed, or evidence of their success. This is a result of a lack of stringently framed and implemented regulations in the livestock and fisheries sectors (MoHFW and WHO 2016; Bushan et al 2016). Coordinated measures should be put in place to combat “pollution scandals” (Changing Markets and Ecostorm 2016); alongside mounting effective antibiotic use surveillance (MoHFW and WHO 2016; Laxminarayan, Duse and Wattal et al 2013).

Overseeing and enforcing such policies and interventions in the dairy and poultry industries will be a challenge (Ramdas 2021). To this end, empowering, resourcing and training a cadre of independent veterinary doctors in AMR and AMS (Antimicrobial Stewardship) is imperative, especially at the local level (Chauhan et al 2018). These veterinarians will help educate farmers and labourers about the risks and opportunities involved in farming, including feed type, animal varieties, and proper waste disposal and land management strategies. Veterinarians working at the community level can also ensure standard treatment protocols are followed, and, with the assistance of farmer associations, NGOs, and local pharmacies, promote best practice. This move to improve veterinary engagement in AMR and AMS and encourage this stakeholder group to be active stewards of diminishing antimicrobials is becoming a focus in many countries.

In the long-term, such interventions may help stimulate a shift from industrial animal farming to that of cage-free and free-range systems, as recommended in the National Environmental Engineering Research Institute report (NEERI 2017). While such a shift will improve the welfare of animals and the environment, it will also help avert the viral, bacterial and fungal evolution so dangerously widespread in the current industrial model, and go some way in delaying the next pandemic (Wallace 2016).

Of course, none of this can be fully effective unless the different levels of government are prepared to confront agribusiness and big pharma about their production and polluting practices. Profit-driven multinational companies need to be held accountable, subjected to strict regulatory frameworks and enforcement mechanisms. Finally, the Indian government should launch a country-wide campaign involving farmers, NGOs and industry to increase awareness about the accelerating hazards of antibiotic misuse at an individual level and as part of a wider food safety programme. This will increase pressure on companies and retailers to take steps to cut antibiotic use by its suppliers, as has been achieved elsewhere in the world.
Endnotes:
[1] Published estimates of greenhouse gas emissions from the livestock centre vary, but recent UN figures are at around 14.5% (Gerber et al 2013).

[2] The local breeds have varying nomenclature; in Telangana they are called natu-kodi.

[3] A simple but effective planning tool highlighting the strengths, weaknesses, opportunities and threats.

[4] There are increasing reports of excessive antibiotics use in both dairy and aquaculture. For an overview, see Taneja and Sharma (2019).


[6] The 2021‒22 budget announced a boost of nearly 200% for developing the pharmaceutical sector to reduce its dependency on the Chinese market, which remains the main source for raw material imports and APIs used in drug manufacturing (Chandna 2021).

References:


Chandna, H (2021): “Budget Gives 200% Boost to Pharma Sector as Govt Looks to Curb


Morens, D, J Taubenberger and A Fauci (2008): “Predominant Role of Bacterial Pneumonia as


