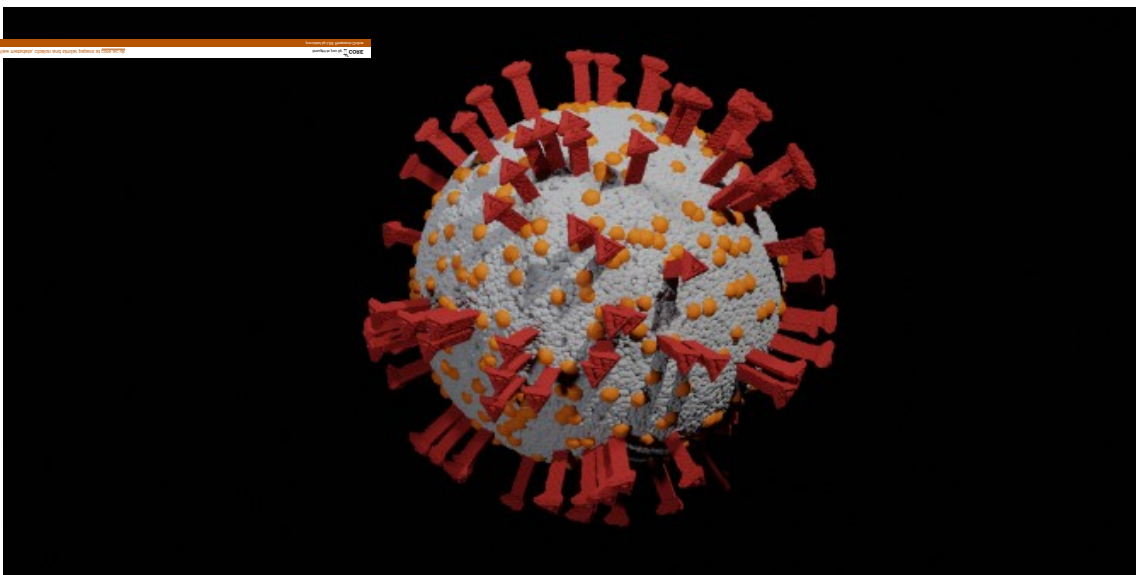


Making the invisible visible: how we depict COVID-19

*How do you depict a microscopic bundle of proteins that in just a few months transformed the world? **Sria Chatterjee** (Max-Planck Kunsthistorisches Institut) looks at how the virus has been visualised in different contexts, and how new ways of tracking and seeing its spread have profound implications for individual freedom.*

This post first appeared on the [LSE COVID-19 blog](#).

Seeing, or the inability to see something, is political. In a world which has tried to make all things visible, the natural history of viruses has been a history of visualisation fuelled primarily by fear. If the source of fear lies in the virus' monstrous ability to mutate, multiply, invade, and in some accounts, carry the threat of foreign or alien chemical contagion, its fiercest weapon is its cloak of invisibility – its ability to do all of this unseen by the human eye.



Visual representation of the coronavirus. Photo: Muennochio. Public domain

As the pandemic progresses, the coronavirus has exploded onto our screens and streets, claiming various kinds of visibility. Visualising the virus has been both panacea and political tool – depending on who does it – and the processes of visualisation are implicated in forms of care as much as they are in political violence, surveillance, xenophobia and institutional racism.

On 10 May, after weeks of lockdown, Boris Johnson changed Britain's coronavirus slogan from 'Stay at Home, Save Lives' to 'Stay Alert, Control the Virus, Save Lives'. The new slogan was immediately slammed for being 'nonsensical' and 'vague'. The question of how to stay alert and control something that is microscopic and invisible to the human eye raises questions about seeing and scale. In the US, Donald Trump's embrace of the phrase 'invisible enemy' went hand in hand with his decision to tighten immigration measures to 'keep America safe' from invasive dangers. In marshalling wartime vocabulary and framing the virus not as a pathogen but as an enemy, and pandemic efforts as 'our big war', Trump's 'invisible enemy' fluctuated in the kind of danger it posed, allowing him to temper the measures proposed according to his fluctuating vision of what the economy and a section of white supremacists demanded.

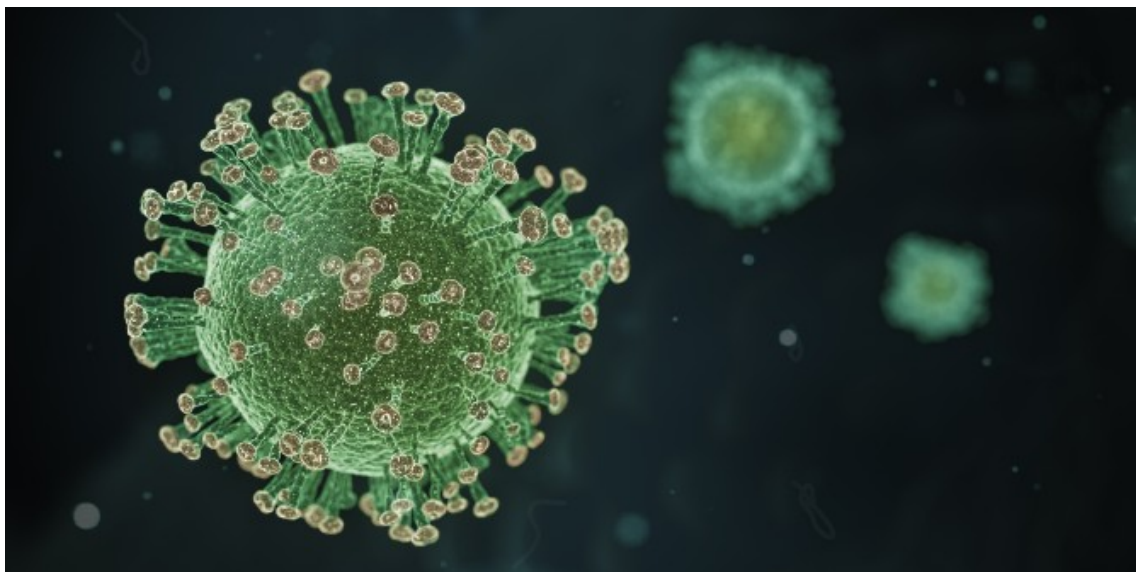


Photo: [Yuri Samoilov \(CC BY 2.0\)](#)

The ironic paradox of the high communicability of the virus and the incapacity to visually communicate it was not lost on organisations such as the WHO, scientists, science communicators and anxious parents trying to explain the situation to young children. In the early stages of the pandemic, scientists and scientific illustrators worked overtime to create images of the snarl of nucleic acids inside a protein shell coated by a fatty sheath. As a recent [article](#) in the Paris Review explains, what we have come to know as the novel Coronavirus – a sphere radiating red spikes – is a combination of the way the coronavirus appears under a microscope and choices that were made to make the image relate-able and virus-like.

As we have known since the 17th century – thanks to British natural philosopher Robert Hooke and later the Dutch scientist, Antonie van Leeuwenhoek's experiments with magnifying glasses and microscopes – most of life is invisible. Bacteria account for around 70 billion tons of carbon, counting as the second largest life form on Earth, second only to plants as a whole. Humans come in towards the very end of the spectrum at 0.06 billion tons of carbon. To dominate a physical space in which you play so small a part has frustrated the Western imagination for centuries. The Enlightenment thirst for seeing and knowing things gave rise to the illustration of micro-organisms and particles, unseen to the human eye. However, it was the application of early modern scientific methods in Europe that allowed European powers to infiltrate a diverse range of distant regions and served as a precursor to settler colonialism, slavery and various modes of domination of natural phenomena – which in their eyes included climates, land, flora, fauna, and native peoples.

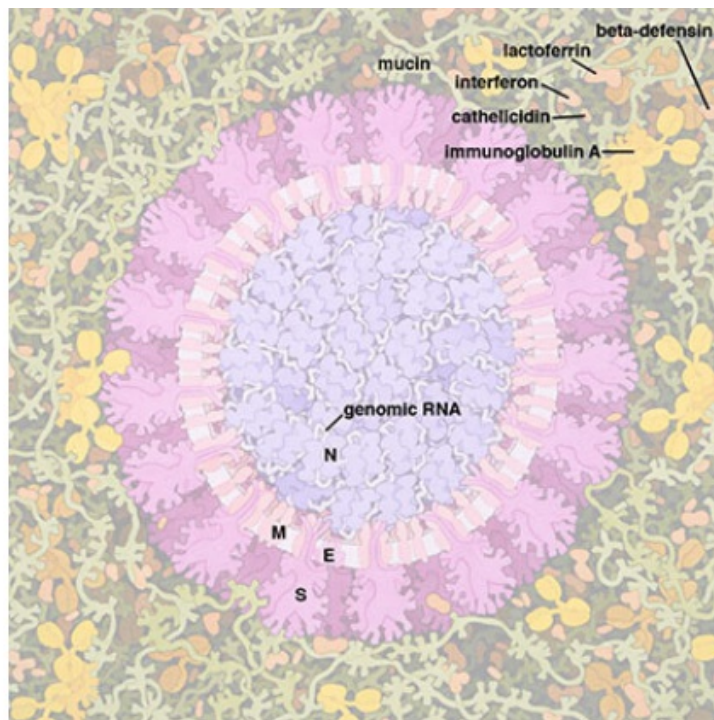
This was the beginning of a connected, globalised world in which the flow of people and goods were mandated by first a mercantilist and colonial economy, then gradually an expanding capital-driven international market. The scaling-up of invisible organisms coincided, therefore, with the scaling-up of the world – from local self-sufficient communities to a set of global interdependencies. The global reach and high efficiency of the coronavirus was indebted to the scientific revolution: the same impulse that allowed us to see the unseeable, which equipped us with the tools with which we visualise the virus today, also laid the foundations for its existence and proliferation.

Structural biologist David S Goodsell, Associate Professor at Scripps's Research Institute and Rutgers University, had been working at the intersection of molecular biology and illustration long before the current pandemic. Goodsell tries to make his illustrations as accurate as possible. His painting of Coronavirus, which has received some attention from the press, depicts a coronavirus just entering the lungs, surrounded by mucus secreted by respiratory cells, secreted antibodies, and several small immune systems proteins. The virus is enclosed by a membrane that includes the S (spike) protein, which will mediate attachment and entry into cells, M (membrane) protein, which is involved in organisation of the nucleoprotein inside, and E (envelope) protein, which is a membrane channel involved in budding of the virus and may be incorporated into the virion during that process.



David S Goodsell's illustration of the [coronavirus](#), via RCSB Protein Data Bank ([CC BY 4.0](#))

Despite the highly aestheticised and flattened quality of the illustration, which resembles a William Morris-inspired wallpaper, the illustration acts as a diagram in which bright colours and intricate interlocking structures are used to indicate how the nucleoprotein inside includes many copies of the N (nucleocapsid) protein bound to the genomic RNA. Goodsell's work literally visualises the invisible, retaining molecular information and presenting the virus as an active, visible agent that is making its way through a part of your body. This allows viewers to relate to the virus as an external body that enters and alters the molecular make-up of your organs, thus mutating not just by itself but with you. PDFs of Goodsell's drawing have been made available online for adults and children to colour in. For many, giving the virus shape and form has been the first step to understanding it and relating to it on a human scale.



Painting by [David S Goodsell](#) based on information about the SARS virus.

As we slip into the final phases of the first wave, the possibility of learning to live with the virus has been floated by various countries. The ability of the human imagination to visualise the invisible, blow up microscopic information and speculate on longer term futures of living differently may be crucial in doing this.

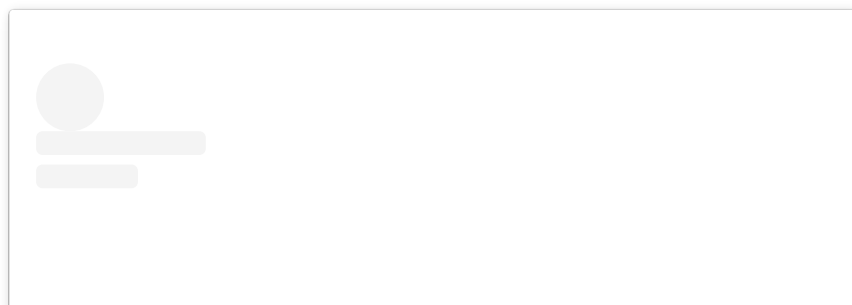
In the state of Bengal in India, a community of scroll painters who practise the folk art of *Patachitra* (literally cloth painting) and who have conventionally travelled from village to village and more recently to urban areas, performing their stories as they unroll their narrative scrolls, have most recently been painting and performing stories about the virus. Swarna Chitrakar's seven-frame scroll features in its first large frame a semi-anthropomorphised figure of the coronavirus. Painted a fiery red with radiating grey spikes all over its body, the large head of this creature is endowed with big round eyes, which also mirror the virus form we have now come to recognise. With a large hungry mouth and arms, claws and two horns on top of its head, the invisible microscopic virus has been given monstrous form. Around it, and far reduced in scale, humans flail around coughing and crying.

To complete the frame, two smaller, rounded virus faces remind us that there is more than one monster to reckon with. As the scroll unfolds, we see men and women in masks washing their hands at a communal tube well and in another frame, selfless health-workers in hazmat suits. Interspersed with sung instructions about the importance of handwashing, when to go to the hospital, news of the lockdown, gratitude to nurses and doctors and news of state-level food provisions for the poor, Swarna Chitrakar's song is at once an elegy and an informative visual narrative of the local and global situation.

Although in their early form *Patachitra* paintings and performances retold mythological stories and often encapsulated some moral values, Swarna Chitrakar and her compatriots have in recent decades made scrolls (sometimes working with NGOs) that narrate the symptoms, dangers and measures to control infectious diseases such as tuberculosis and HIV-Aids. While the coronavirus scrolls follow in a similar strain, no narrative is free from the hazards of the circulation of (racist) propagandist constructions. The song repeats what it has picked up on the national news and names the coronavirus 'the virus from China'.



At Mutitjulu, the small indigenous community at the base of Uluru, in the southern part of the Northern Territory in central Australia, Anangnu artists at the Walkatjara Art Centre have been working on dot-paintings that variously depict the coronavirus and the messaging around the pandemic. Pollyanna Mumu portrays (in image 2 of the Instagram post below) a large group of the Anangnu community with health staff. The painting takes on a broadly circular shape with concentric circles on the inside and radiating tentacles. It might come as a surprise to know that when the painting was done, the artist had not seen the standardised coronavirus illustration circulated by the media. The ample visual parallels between indigenous dot paintings and micrographs of natural structures are not hard to see, and have been explored in an exhibition entitled [Stories and Structures](#) presented by Microscopy Australia. While microscopic images expose the structural details of the natural world, allowing researchers access to scales beyond the human eye, indigenous (Australian) paintings store stories and records of the Dreamings, portraying how the earth came into being, how the land and its creatures were created and learned to co-exist. In other words, they hold an informational structure that makes space for geological and cosmic time – and creates ways of knowing and seeing the world at multiple scales.





[View this post on Instagram](#)



Last week, Mutitjulu artists were busy creating vibrant paintings to illustrate the impacts of COVID-19, which are being distributed around Mutitjulu to spread awareness of the virus. Way to go ladies! The community has requested that the original paintings are not for sale, however we wanted to share them with you all here. The paintings read, in order of appearance: Rene Kulitja: "The world is changing" Pollyanne Mumu: "Keep your hands clean" Rowena Pei Pei: "New rules are to keep you safe and alive" Renae Cooper: "Keep washing your hands so you don't spread germs" Jake Kitson: "COVID-19 is a serious sickness" Charmaine Kulitja: "Don't go to Yulara, stay at home" Sandra Wilson: "Keep your hands clean. Dangerous sickness" Elizabeth Wilson: "Terrible sickness" Yaritji Miller: "Keep your hands and homes clean" Miriam Taylor: "Keep washing your hands so you don't get sick" Have a happy and safe Easter long weekend 📸 📸 #mutitjulu #ananguland #aboriginalart #walkatjara #uluru #redcentrent #dot painting #strongculture #coronavirusaustralia #safehands #togetherathome #covid19

A post shared by [Walkatjara Art \(@walkatjara\)](#) on Apr 9, 2020 at 6:15pm P..

On this Instagram post, the second (Pollyanna Mumu) and eighth (Elizabeth Wilson) images are discussed in this post.

Indigenous artist Elizabeth Wilson's work (image 8 of the Instagram post above) in shades of red and brown brings us to a scene inside the Uluru-Kata Tjuta National Park where a line of artists (shown as black horseshoe shapes) are separated from a line of tourists (white horseshoe shapes) by a line of square canvases. Lurking behind the artists, unbeknownst to them, floating virus shapes envelop the scene. The decision by Parks Australia to close the park relatively early on in the coronavirus crisis was welcomed by the artists. Elizabeth Wilson's painting speaks to a long history of devastation caused by novel diseases through invading Europeans. The arrival of these epidemics was doubly invisible in that the first epidemics often arrived in indigenous societies across Australia and the Americas even before the inhabitants knew about the arrival of Europeans. Infections travelled easily and quickly through networks of connection along indigenous trade routes, from body to body, unseen. Higher instances of underlying medical conditions and suppressed immune systems in these communities compounded by the fact that in remote areas it is harder to access healthcare mean that Indigenous communities are also at higher risk of COVID-19.

Questions around the disproportionate number of deaths among Black and ethnic minorities including doctors and other NHS workers in the UK and more broadly in the US and elsewhere have been raised during the current pandemic. The answers are not simple, but seem to hinge on a combination of factors that include biological differences and the way immune systems function, lack of resources and unsuitable housing conditions (including overcrowded homes), and in many cases, lack of access to proper healthcare – the latter factors founded squarely on deep histories of racial inequality. In boarded-up and deserted south London, a [multi-panel street mural](#) depicts three portraits of Black doctors and nurses at work, in their scrubs, while at the far end, a panel (added by a different artist) shows a black health worker in scrubs now immobilised by the virus, in a hospital bed on an intravenous drip.

Locating biological difference between white and non-white bodies has long been a part of medical training and the ways in which diseases are understood. However, the pathologisation of black bodies has also given the medical establishment an easy rationalisation for uneven numbers of cases for various illnesses, and the gene has often stepped in to explain other social determinants away. The coronavirus' attack on the lungs, its annihilatory insistence on taking away human breath, has only been recently matched by another annihilatory invisible force – the use of tear gas on Black Lives Matter protestors across the US during the pandemic. Consisting of aerosolised solid or liquid compounds (bromoacetone or xylyl bromide), exposure to high levels of tear gas carries [increased risks of respiratory illness](#). In weaponising the air while the virus is still likely to be circulating, the impact of a double attack on human lungs is an act of targeted institutional racism. It allows the police force to create the precondition that makes COVID-19 cases fatal. It collaborates, then, with a non-living agent – the virus – to take away what [Achille Mbembe calls](#) 'the universal right to breathe'.

The other way the virus has been visualised and mapped has been in and through our bodies. To try to trace the pandemic is to make a visual diagram of our social interactions and movements. As our bodies physically move through space, meeting family, friends, colleagues, and strangers, some tracing apps use 'signal intelligence' – the surveillance of all personal devices to map individual movements. When a body is infected, these apps can automatically alert the other 'signals' or bodies that the infected body has come into contact with, thus creating a visible grid along which the virus is expected to move. All of these apps have raised major privacy concerns, because they need to store user data on central servers if people are to be identified and tracked.

Taking this a step further, pattern recognition algorithms try to establish patterns on the level of individual interaction as well as the population to first record all past movements, and then mathematically model future movements based on the patterns that have emerged. This would mean not only that your data, social networks, past and current movements are stored but your future actions are made visible – not to you, but to somebody else. The visual mapping of the movement of the virus is therefore a larger visual mapping of your habits, interactions and homes. In the wrong hands, seeing the virus can be tantamount to controlling the population, a surveillance state. In the hands of the people, visualising the virus has been various things – a means to spread information, a coping mechanism, but mainly cold comfort.

Note: This article gives the views of the author, and not the position of the LSE Impact Blog, nor of the London School of Economics. Please review our [comments policy](#) if you have any concerns on posting a comment below.

Featured image credit: David S Goodsell's illustration of the coronavirus, via RCSB Protein Data Bank ([CC BY 4.0](#))
