Visual representations of the COVID-19 pandemic and its iconography on a local/global scale: Crossing borders between scientific and non-scientific imagery

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Cogent Arts & Humanities (2022), 9: 2055710
VISUAL & PERFORMING ARTS | RESEARCH ARTICLE

Visual representations of the COVID-19 pandemic and its iconography on a local/global scale: Crossing borders between scientific and non-scientific imagery

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Abstract: Understanding how the COVID-19 pandemic has been visually represented in both scientific diagrams and in non-scientific expressions, such as quickly propagating memes, both on a local and global scale, offers a glimpse of the ways in which the pandemic has been perceived and socially appropriated by diverse online audiences. In addition to analyzing the particularities of digital media and their ability to cross borders, an interdisciplinary perspective based on visual analysis and close looking—as seen through the scrutinizing eye of art history, in tandem with the double lens of microbiology and physics—provides a fresh outlook on the phenomenon of representation as a human form of engaging and coming to terms with a critical historical event, in particular, one that is triggered by an invisible phenomenon, a virus. Furthermore, a historical sense of the ways in which earlier pandemics have been represented provides a comparative lens for better understanding the specific situation of this particular pandemic and its unique iconography. Finally, a contrast between global and local forms of representation.

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PUBLIC INTEREST STATEMENT
The ways in which scientific and non-scientific images have intertwined with one another throughout the COVID-19 pandemic marks an unprecedented sharing of imagery. This paper offers an interdisciplinary interpretation of images shared globally in social networks, and reflects on the power of those images and their participation in the narratives that helped to make sense of the pandemic. It is intended for any curious reader interested in following our efforts as contemporary human beings to understand the complex events related to the pandemic. Also, it can be of special interest for researchers and students of sciences, visual arts, art history, media studies, and other social and humanistic areas, as an example of the results attainable from the close interaction between researchers working in different disciplines such as arts and sciences.
and circulation, by providing some specific examples from Colombia, one of the countries with the highest number of cases, underlines the ways in which imagery is infused with political connotations, with the power to both inform and disinform, depending on its use and context.

Subjects: Microbiology; General Physics; Art & Visual Culture; Media Communication

Keywords: iconography of Covid-19; graphic representation; visual culture of pandemics; scientific illustration; images of viruses

1. Main text introduction

In contrast to previous pandemics in human history, Covid-19 has been characterized by the simultaneously shared experience of ordinary citizens on a global scale. Digital technology and social media have played a fundamental role, exacerbating our place both as spectators and participants in a real-time spectacle, as well as the rapid, bottom-up production and circulation of specific imagery as a response to the crisis and a way of making sense of our sudden, new reality. Indeed, one may assert that a particular iconography of the experience of Covid-19 has both emerged and developed in wide-ranging ways, while being adapted in local terms to specific political and cultural circumstances. Through a combined perspective involving the close looking of both art history and microbiology, together with an analysis of graphics from a physics point of view, we will confront the ways in which visual representations became a central form of dealing with the pandemic: the overlapping borders between scientific and nonscientific imagery, along with their functions, will be analyzed, while taking into account some of the ongoing shifts between the global/local experience of the pandemic. By focusing on some examples from Colombia, the third country in the Americas reporting most cases (after the United States and Brazil) and with one of the longest lockdowns, we will disentangle some of the iconographic specificities of these representations in a particular context.

Some of the particularities of the widespread iconography of Covid-19 have been recently noted by other scholars, who have engaged with the social dynamics of representational maps and widely-circulating photography, as well as other visual phenomena. Dominant genres of imagery have also been categorized: new “heroes and sinners”, as well as “stages” made up of emptied cities and domestic spaces, repeated and adapted over and over in different settings. One common issue noted by some of these scholars is the problem of representing the invisible: an invisible virus with the ability to turn our world on its head, along with the inaccessibility of images in some of the most-affected areas. To this we might add the oft distorted access to scientific evidence and the circulation of disinforming opinions, a theme that has also been central to the discussions surrounding the virus and its representations, as we shall see. While remembering the common ground for memes and genes, we ask how self-propagating images on a global/local scale became a way of learning about the virus and dealing with it on many levels, whereby images are the common ground for this uniquely globalized, online experience.

Objectives and research questions (stated in the Introduction):

- To show and chart how a particular iconography of the experience of Covid-19 has both emerged and developed in wide-ranging ways, while being adapted in local terms to specific political and cultural circumstances.
- Through a combined perspective involving the close looking of both art history and microbiology, together with an analysis of graphics from a physics point of view, we will confront the ways in which visual representations became a central form of dealing with the pandemic: the overlapping borders between scientific and nonscientific imagery, along with their functions,
will be analyzed, while taking into account some of the ongoing shifts between the global/local experience of the pandemic.

- By focusing on some examples from Colombia, the third country in the Americas reporting most cases (after the United States and Brazil) and with one of the longest lockdowns, we will disentangle some of the iconographic specificities of these representations in a particular context.
- We ask how self-propagating images on a global/local scale became a way of learning about the virus and dealing with it on many levels, whereby images are the common ground for this uniquely globalized, online experience.

2. Materials and methods
The primary sources of our research are images—both scientific and non-scientific—which are discussed by using visual analysis, a methodology taken from art history, which involves close looking, but also contextual and cultural analysis. Likewise, the abilities developed in scientific looking, particularly in microbiology and in the field of scientific illustration, are applied to approach our primary sources as a common language for science and the visual arts. Applying these different methodologies through the triple perspective of art history, microbiology and physics allowed us to analyze the ways in which these images were constructed and how they circulated both on a local and global scale in the context of the pandemic. Over 250 images were collected between March 2019 and March 2020; these were then organized into different 30 iconographic categories and typologies, but also considered in terms of their chronological appearance while recognizing the different media and platforms in which they circulated. We selected representative images of a particular iconographic type or typology, by taking into account the following criteria: images that circulated both on a global and local scale or were adapted in different Latin American and Colombian local contexts and translated into multiple languages; images that crossed scientific and non-scientific boundaries; scientific images of the virus that were published in an academic or specialized setting but that were adapted and translated into different formats and popular media. Finally, a review of the literature on the visual representations of viruses proved fundamental for contextualizing the discussions surrounding representation in scientific illustration, in particular in the case of COVID-19, but also for reflecting on historical perceptions of diverse pandemics or viruses (for example, AIDS and HIV) that could serve as a comparative basis for understanding the different issues involved in the transmission and circulation of scientific information in visual form. Likewise, the inclusion of media articles serves to highlight issues of divulgation and the circulation of Covid-related imagery in a broad context.

3. Results
Throughout this analysis, we were able to identify specific patterns in the local/global experience of the pandemic through the interactions of scientific and non-scientific imagery, including artistic responses, as part of the visual culture associated with COVID-19. At the same time, we were able to observe the appearance of new visual narratives that emerged at different times throughout the first year of the pandemic. By organizing the images into different typologies (scientific illustrations of the virus and their popularized versions; graphic representations of the pandemic in space and time; artistic conceptions and responses to scientific images and representations) we were able to map the ways in which visual culture has provided a didactic means to approach the pandemic in both scientific and non-scientific communities. We believe the methods and results of this cross disciplinary article will signal new approaches for working collaboratively, in regard to the function of visual culture in a pandemic as lived in a globalized, interconnected world. As noted by the recent editorial titled “Collaborations with artists go beyond communicating the science”—Nature, vol.590 (18.02.21), p.525—the connection between arts and sciences is not just an issue of communication or translation, but a way of developing innovative thinking.
4. Discussion

4.1. Setting the scene: Writing Covid-19 into our globalized lives

A survey of how people across the world came to realize that the pandemic was arriving to their hometowns and that Covid-19 would soon become part of their reality might yield interesting results with regards to the symbolic uses and functions of imagery. In addition to news media coverage of the emerging pandemic in China and Italy, the first tangible images of the actual virus most probably arrived as memes or digitally-produced versions through social media.6 (figure 1) As if trying to prepare ourselves for the unthinkable, we began sharing images on social media that announced a shift in our everyday lives, such as covering our faces, as can be seen in this widely-circulated image of emoticons (emotion icons) wearing masks. (figure 2) What seemed to be a surreal, far-away experience of “them” (rather than “us”) slowly became real thanks to the ever-growing images announcing the virus’s imminent arrival in places, such as Latin America, where cases of the disease caused by SARS-CoV-2 had yet to be registered.

As noted by Paul B. Jaskot, the “global” experience of the virus only becomes one when it arrives locally or when media turn their attention to the disease; in other words, global experience is hierarchized depending on who tells the story.7 Indeed, one of the paradoxes of our globalized world is that globalization is inextricably tied to the dominant narratives of the North (Europe and North America) and only when problems from “other” nations enter into the dominant narrative do they truly become “global”. Lecturing at the Digital Art History Journal Conference in April of 2020, Jaskot provocatively asked whether the explosion of images would still be in the media, a few months from then, as the disease shifted into the Global South. Two years into the pandemic, while the international networks tend to focus on images from the North, another type of visuals continue to trickle into our screens and devices through social media, both circulating worldwide and being simultaneously appropriated in varied local terms, highlighting the coming and going of dominant narratives, together with the mixing of different genres.8

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Figure 1. Anthropomorphized Covid-19. Circulated on Whatsapp in Colombia on the day of the first identified case of Covid-19 in the country (6 March 2020).

![Image of Covid-19 emoticon with text: YA LLEGUE](image1)

Figure 2. Masked emoticons. Circulated on Whatsapp in Colombia in early March 2020.

![Image of masked emoticons](image2)
Some of the early images that emerged during March of 2020 harbored doubts about the actual pandemic, wondering whether it was a mediatic event rather than an actual virus that would take over the world. (figure 3) Skepticism about the reality of the virus persists in an ideologically divided world and, often too, in divided nations, in which part of the population refuses to wear masks or protests government-imposed restrictions. Nevertheless, the iconography of Covid-19 tends to emphasize its presence, rather than its nonexistence, albeit through “indirect” strategies, as posited by Julia Sonnevend: in light of the difficulties of actually accessing real-life situations, representations of the virus in abstract terms and of emptied spaces became dominant genres for confronting the very invisibility of the virus itself.

Circulating images on social media competed and overlapped with those in the news: some of the earliest visual jokes imitated the “flattening the curve” graphs, reminding us of the relativity of certain possessions (such as cars and toilet paper), including the conflicting information initially emitted by the WHO regarding the use of masks. (figure 4) In some ways, such images aided in the transmission of specialized reading skills of a particular type of information, for example, the graphs showing the number of cases behaving in an exponential way. This became, as we shall see, one of the dominant forms of representation in the early days following the official declaration of the pandemic by the WHO. And just as the hashtag #WhereisBoris was intended to wake up the British government from what public opinion perceived as sluggish action, another bottom-up strategy used art works to remind people to #StayHome #Quédateencasa. Spanish photographer David Bokeh created an entire series of emptied works of art titled “The art of staying home” by digitally removing the figures and leaving only their background, in order to reinforce the message of #YoMeQuedoEnCasa.

These diverse uses of imagery reflect age-old functions of art and of images in both art and science: to serve a didactic, educating function, but perhaps, and most powerfully, as a subversive strategy to combat, in this case, a fear of the unknown. In all these cases, images provided a synthetic approach: from the ability to convey the essential identifying features of the virus (its spikes and crown), to the need to simplify complex messages through an apparently common visual language, accessible for all. Nonetheless, images and representations are never innocent;
rather, as we shall see through specific examples, they are charged with cultural traditions and politics, whether intended or not by their users and makers in a shared digital world.

4.2. The emerging iconography of Covid-19: Between art and science
As already noted by Julia Sonnevend, “we can see the key actor, the virus, only in artistic representations”. Indeed, some of the most widely circulating images of the virus are artistic, rather than scientific, albeit based on a scientific model to begin with. According to Sonnevend, the public’s inability to visually access certain sites, such as intensive care units or prisons, through actual photographic images might make people less likely to behave as public health experts would wish them to do so. Nonetheless, dramatic photographic coverage did reach out through news media: from the dead bodies lying for days in the streets of Guayaquil and overwhelming images of mass burials in make-shift cemeteries outside of New York City, to documentary-style testimonies of the hard-hit region of Lombardy in Northern Italy. Could it just be that hand-made and digitally-produced images exert a different type of effect upon us and that there is a symbolic need for graphic representations, beyond photography? From a scientific perspective, visual representations are an essential part of scientific thinking in order to approach the object of study that is unavailable to the naked eye, whether these are far away objects in space or nano particles that cannot even be observed through a microscope. Likewise, graphic visualizations are fundamental for describing theoretical results, as is the well-known case of Richard Feynman’s diagrams. In microbiology, for example, illustrations are required in order to interpret the images obtained through microscopic viewing. Indeed, as we shall see, the production of any image of a virus requires a sophisticated process of visual interpretation.

The invisibility of viruses to the naked eye is a perpetual challenge for the field of scientific illustration, one that has to be sorted in creative ways and which depends on the type of message that one intends to communicate. In order to represent a virus, illustrators must undertake a process of selection, translation and interpretation of the images obtained through electron microscopy (EM), originally created for visualizations in the field of physics. Using electrons rather than light, EM is the only way to actually see viruses: a beam of electrons is passed through the sample so that the atoms in the sample scatter the electrons, which then go through a series of lenses. The scattered electrons are what generate the image in shades of gray. (figure 5) Moreover,
in order to observe viruses, the susceptible cells must be infected and cultivated under conditions permissive to viral replication. Then, several steps must be followed to separate viruses from the other components (cells, cellular debris, salts) in order to obtain a sample with viruses as pure and clean as possible.\textsuperscript{17} This process explains why viruses are often shown as if “floating in a void” in EM images. (Figure 6) Furthermore, these images are usually computer-edited (colored, hued, contrasted) in order to enhance the visualization of the viral structures and to reduce any background noise.\textsuperscript{18} Taking the EM-generated images as their basis, computer reconstructions and 3D animations are then used to teach and communicate information about viral structures and biology. They also serve to propose hypotheses to be tested about the interactions between viral and cellular structures, all within a scientific, restricted environment.

This type of image generation is common practice within science and, in particular, for the study of microorganisms, where images are used by microbiologists, immunologists and virologists for research, educational and science communication purposes, within relatively restricted circles. 3D images and animations of different viruses are continuously being developed, but perhaps none have received as much global attention as that of SARS-CoV-2.\textsuperscript{19} It is interesting to note that in the educational poster of the Ebola virus produced by Visual Science, essentially an infographic displaying a 3D model, the image shares the same gray textured body and red protruding components (which are in fact the 5 proteins that attach to the host cells) as the renowned representation of SARS-CoV-2 produced by Alissa Eckert and Dan Higgins at the U.S. Centers for Disease Control and Prevention (CDC).\textsuperscript{20} (Figures 7 and 8) Emerging from a dark gray, unfocused background, the recoiling shape resembles a reptile or worm-like body in movement. It seemingly advances from back to front, its body placed in perspective. The liveness of the figure is an oft
sought-after effect in these types of illustrations, so as to emphasize the danger of infection and make the public wary. Unlike the vividly colored electron micrograph images of the virus which emphasize its characteristic swirling tendrils, the effect of the 3D interpretation plays on the theatrical contrast between light and dark, and despite the rigorous scientific explanation included in the poster, the immediate visual effect of the voluminous creature resonates threateningly to the viewer. It should also be noted that such images are not actual portraits of a virus itself but
instead offer a 3D view of the basic structure of the virion, that is, a viral particle and the array of its components.

As analyzed by Hélène Joffe and Georgina Haarhoff, media coverage of the Ebola outbreaks in West Africa and its use of photography tended to signal the “otherness” of the virus, as a “far flung illness” that was constructed as “African”\(^\text{21}\). We should recall that Ebola case fatality rate is around 50%, quite different from SARS-CoV-2, which is on average c.a. 3% and is greatly influenced by age (up to 20% for +80 and as low as 0% for 0–19).\(^\text{22}\) Despite this difference in fatality, the use of the representations of Ebola virus restricted to a particular kind of mediatic message, while comparatively, the COVID-19 virus is a rock star in media and the popular imagination. Nonetheless, it should also be noted that, as in the imagery surrounding the Covid-19 pandemic, images of the Ebola virus have also been creatively appropriated and turned into various types of affective objects that range from mugs to earrings and seals.\(^\text{23}\)

In contrast, SARS-CoV-2 has been by far the most visually represented virus in all virology history. As previously noted, its representation as a gray globe with red spikes was designed by Alissa Eckert and Dan Higgins at CDC, with the specific aim of raising awareness among the general public. Sonnevend rightly comments on the puzzling emphasis placed on “touch” in the 3D illustration of the coronavirus, turning it into an attractive “beautifully arranged flower bouquet”.\(^\text{24}\) The attractive aspects of its variants are also analyzed by Colette Gaiter, who notes that many of its “offshoots are the opposite of alarmist.”\(^\text{25}\) Much like the 3D model of Ebola by Visual Science, the body of the virus is isolated, floating mid space and rendered in what is known as a close-up “beauty shot”.\(^\text{26}\) This form of representing the virus (in fact, a virion) provides it with a single, well-featured body, which in turn gives it a singular, specific identity, much like in the tradition of portraiture. Indeed, this particular identity of SARS-CoV-2 became viral, reportedly taking its scientific creators by surprise. Soon enough, the features of the virus’s basic morphology made their way into innumerable images of all sorts: from street art to memes and caricatures. Interestingly, in numerous cases, the preferred color of representation is green, rather than the original red hues of the scientific model. The images of the coronavirus found their way into a number of different realms, in which the scientific representations were taken over by various image-making practices that turned them into significant variants of one another. Such practices may be traced back to the need for image making as a form of sympathetic magic, consolation and appropriation.\(^\text{27}\) Even the very basics of apotropaic imagery come into play in this process: not unlike the portrait-like reliefs of Medusa in Archaic Greece, meant to ward off evil and protect temple dwellers, the isolated, unfocused “portrait” of the virus turns it into a type of amulet imbued with the potential of metamorphosizing into a living being.
Before the coming into being of a Covid-19 iconography, the practice of anthropomorphizing viruses was generally reserved for microbiologists as an insider joke: instead of fluffy animals, microbiologists own “fluffy microbes” of all sorts. (figure 9) Unlike the more menacing or wincing anthropomorphized images of the coronavirus in popular culture, the “plush viruses” tend to be soft and cuddly, just like fluffy animal toys, pointing to the insider knowledge that viruses need not be feared but rather understood and loved as objects of study.28 A few anthropomorphized exemplars of Covid-19 point to a similar tactic, albeit—and most likely—of an unconscious sort, such as the drawn caricature in which a kiwi narrowly escapes an attack by its fellow fruits, who have confused it with a coronavirus due to its round spiky form. (figure 10) Here, visual likeness serves as an analogical lesson for viewers of the image, indicting them to look closer and to look carefully. Similarly, knitted coronaviruses with eyes and ears made it into shared social media, such as this textured creature that closely resembles the CDC model, even including the yellow and orange spikes (protein E and protein M), but surely intended for a nursery. (figure 11) In Colombia, such fluffy coronaviruses featured in the traditional end-of-the-year ritual of fabricating personified “años viejos” (“past years”) to be burnt on a bonfire, signaling the ritual passing of the year.
No longer reserved for a particular group, these stuffed viruses serve the larger purpose of familiarizing us with the basic features of the coronavirus, while also acting as a bridge to conquer the virus and overcome our fears of its invisible force. In this case, the power of representation comes as a collective act of appropriation and the possibility to overcome the looming and much feared, yet invisible, virus.

4.3. The bigger iconographic picture: Tracking the virus in maps, graphs and diagrams

Beyond the specificities of the virus rendered in its many shapes and forms, a bigger iconographic picture or landscape was also set into motion from the start of the pandemic. Segmented maps or world views with titillating red dots served to show the onset and comparative growth of the virus throughout the world. As shown by Paul B. Jaskot, the digital maps used by the media tend to give weight to different aspects or arguments, depending on who is making them and from what geopolitical perspective. His art historical analysis of the ways in which different media use maps takes into account the scale and the size of the icons, along with the use of visual cues such as saturation and coloring, while connecting these modes of representation with longstanding traditions related to the cure and the pathos of disease.29 The same system of glowing red dots of differing sizes was implemented in local maps, such as this early image of confirmed cases in Colombia. (figure 13) In addition to the image of expanding contagion on world maps, graphs that illustrated the rising cases became the dominant rhetorical form used by media and governments alike to convince their audiences and citizens to stay home, as a way to combat and contain the disease.

Like maps, graphs are forms of interpreting and representing space, time and place. While maps provided the spatial imagery to show the growth of the virus in pictorial terms, graphs were
displayed relentlessly on a daily basis on different websites. Various articles explained how to interpret such graphs, didactically showing the difference between linear and logarithmic scaling of the same data. As data scientists celebrated the renewed interest in such graphs and the general public's attempts to grasp their meaning, an increasingly sophisticated display of graphics was developed by certain media in order to contrast daily cases in different cities, regions and countries, as is the interactive series produced by The New York Times. The consecutive views of the graphs by countries, along with the numerous displays of graphs in a section titled “Charting the Spread of the Coronavirus”, may well be catalogued as a visual collection or synthesis in of itself. At the same time, one of the problematic issues regarding data depictions, as is evident to experts in information design, is that such graphs tend to be taken as transparent scientific data. As noted by Sonnevend, “The flattening curve’ graph provides the viewer with the illusion of being an insider of science who truly understands complex medical processes, but the graph is in fact every data scientist’s nightmare.” Indeed, a retrospective analysis of the “flattening the curve” chart, despite its effectiveness, evidences some of its more problematic issues, such as the lack of inclusion of specific numbers and the fact that it was derived from an earlier diagram (dated 2007) designed for a hypothetical purpose in a different context. Perhaps its very simplicity was the reason for its effectiveness.

In general, the media used gaussian curves to represent complex concepts in a simple manner, while attempting to show exponential growth; in other words, they functioned as rhetorical strategies to educate and convince their viewers. The principal message of these graphs (as a function of time) was that the number of cases grow exponentially, alerting the public and the health authorities. Yet, without referencing the total numbers of a particular group or population, often times the comparison between graphs lack a fundamental point of analysis. Another of the great misunderstandings in the analysis of the indicators in the graphs occurs in everyday language: the Colombian media, for example, still insist on reading the graphs as a way of avoiding another “peak”. As the curves on the graph begin to rise, it is impossible to evade peaks; the question is how long lasting and how sharp these will be.
On a visual level, these graphs feature the characteristics of a landscape. Even the language used for describing them referred continuously to “peaks”, “valleys” and “plateaus”. Indeed, these varied landscapes were the reflection real-life scenarios, which varied according to the socioeconomic conditions of nations and entire continents. Despite having some of the longest lockdown periods, in Latin America the tendency was to remain on a high plateau; meanwhile, countries in the North, with a mayor ability of staying home, saw their peaks lower drastically into valleys. This became particularly evident during the “second wave” of the virus; while countries in Latin America had the ability to gaze into the future as they saw countries in Europe beginning to shut down for a second time, media analysts reflected on the reasons why Latin America had not been able to lower the curve at the same rate as their European counterparts.\(^3\) (figure 14) In other words, the comparative method used by the media to show rising cases not only translated numbers, but also depicted contrasting realities: in countries without the proper social and governmental resources for people to stay home, as was the case of Latin American nations, the high plateaus seemed to resemble the very geography of the Andean landscapes, while reflecting their socioeconomic realities. Memes too contributed to this discussion by playing on these very contrasts and highlighting the social differences between countries: in one of the “Swole dog vs cheems” memes, while Spain relapsed into a second lockdown, Colombians, barely coming out of a “heroic” five-month lockdown, smirked at their previous Colonial rulers for their “weakness”. Similarly, the imagery of sea landscapes entered into popular depictions, as can be seen in the renderings by Pictoline, the Mexican illustrators, in which overlapping tsunamis begin to overtake various nations, including Latin American countries, during the second wave of the virus towards the end of 2020 (figure 15).

An alternative model to these landscape-like graphs was developed in Colombia as a way of tracking the spread of the virus in a controlled setting, with the idea that it may be applied in
different contexts. By mixing various models from quantum and classical physics, this method allows for the visualization of social interactions between individuals, thus providing a way of detecting the propagation of the virus while maintaining optimally sized groups in determined closed spaces. The key to this model is its consideration of interactions, concentration and density, rather than focusing on isolated individual behavior, which is the main rhetoric of the previously discussed graphs. Thus, rather than favoring the message of staying home, this model supports the possibility of human encounters. In this case, its visualization is a tool that not only serves to point to the actual contacts between people, but also provides a hopeful narrative for the future. In the obtained images after information and data are introduced into the model, each point represents a person, while the floating links represent the number and intensity of interactions between clusters of people throughout a period of 15 days, that is, the equivalent of a standard quarantine. While clusters show concentration, colors detect specific groups of people (figure 16).

As such, these physics graphs take into account time, space and place in a dynamic form. In opting for a spherical form for representing space, the model seems to allude to cosmographic imagery, thus providing a less linear way of representing and thinking about interaction. At the same time, form and color provide a way of showing the complexities of the reality of the virus’s propagation in a simultaneously synthetic and simple way. Like other graphic visualizations that
we have analyzed, the aesthetic choices built into the images generated by this model serve to clarify and differentiate groups and number of contacts. Indeed, as we have seen, the place of art within the iconographies of the pandemic is central in a number of ways, including its ability to establish a common ground for crossing borders between scientific and non-scientific imagery, while also bridging communication for different communities across digital space.

4.4. A place of and for art amidst the pandemic: Lockdown imagery and the iconography of space

The use of art as a social tool for coming together during the pandemic has become a genre in of itself. It is not only that artistic works were manipulated, transformed and imitated through a variety of public initiatives, often backed by museums and governments, but that they seemed to serve a particularly powerful form of human connection. In addition to the “quarantine challenges” posed by museums such as the Getty and the ways in which artistic works were turned
into didactic propaganda by the Ukrainian government, for example, people organically came up with their own initiatives. Indeed, perhaps one of the most popular pastimes during the first global lockdown between March and May of 2020 was to imitate famous art works on-the-spot, through the imaginative composition of quotidian objects, and then share them on social media. As such, the recreated art works provided a form of shared satisfaction, as well as a mode of humanely connecting across digital space.

In addition to creating live versions of renowned art works, the practice of emptying images of their figural content through digital removal also became the subject of memes and extended artistic projects. In particular, The Last Supper by Leonardo da Vinci and Las Meninas by Diego Velázquez were adapted to represent different stages of the initial lockdowns, seemingly serving the universal purpose expected from masterpieces. From the emptiness of the Milanesian Last Supper with the text “Qui a Milano stiamo esagerando” (“Here in Milan we are exaggerating”) to the more light-hearted play on Judas’s betrayal through the intermittent microphones of Zoom and other platforms, these art works provided a central stage for enacting a variety of sentiments and everyday situations, while also reminding their viewers to stay out of public spaces and stay home. (figure 17) As such, the genre of empty streets and cities discussed by Sonnevend as a “stage of the crisis” is not simply a matter of photographic register, but seems to reflect a more general sentiment towards emptiness: perhaps as a reaction to the surprising loneliness of vast cities, the impulse to empty works of art of their main figures became a necessity. Metaphorically, this dissembling of pictures might stand in for the in-between moment that we seemed to be living in, from the perspective of a new topsy turvy world.

It is worth noting that these pictures are not just any representations, but two famously staged images of Euclidean space: both The Last Supper and Las Meninas have been the subject of numerous discussions regarding perspective, the viewer’s place, and the inverted roles between subject and object of the image in the case of Las Meninas. While the Mona Lisa became the principal actress to stand in for our shifting moods throughout the pandemic (from waking up disheveled to frantically cleaning and relaxing alone at the Louvre), attention to Las Meninas and The Last Supper, but also Rembrandt’s Anatomy Lesson, focused on their spatial setting. As icons in of themselves, these works are representations of exceptional situations (of religious and secular group portraits of elites); yet, without their figures and through the digital appropriation of these depictions, the exceptional becomes quotidian, allowing the emptied perspectival boxes to be eventually filled with any other living protagonists and their everyday habits. Moreover, in reminding us that Renaissance and Baroque pictorial spaces evoke the notion of pictures as windows, these images stand in perfectly for screens and the new digital platforms that have staged and transformed human interactions in unique ways during the Covid-19 pandemic. That being said, the visual reference to screen-like supports also found an amicable connection to Medieval illuminated manuscripts, whose flattened page divisions provide a natural reference to Zoom-like frames (figure 18).

4.5. Bringing the past into focus: Earlier pandemics and their representations

Just as art works became the subject of a shared online experience, distracting us but also making us learn about art and about ourselves (probably more than about the virus itself), history became another important tool for horizontal internet learning throughout the pandemic. The compare and contrast method of art history was particularly highlighted in the series published by History.com on the “Spanish Flu” of 1918–20, in which photographs play a central role. What Covid-19 is to the digital era, the Spanish Flu was to printed newspapers and black and white photography. Similarly, the Museum of the City of Bogotá showcased an online exhibition with caricatures and illustrations from that pandemic in Bogotá, focusing on contemporary illustrations from newspapers and magazines with specific, recognizable topography for current viewers. (figure 19) Even more distant pandemics became the subject of divulga-
both specialized and general articles highlighted the issue of “innovation” in fourteenth and fifteenth-century Italy, when doctors and laws began recommending the very actions undertaken by governments of the 21st century. Again, images became a vehicle to demonstrate how pandemics had affected past generations as much as ours: the reactivation of “wine holes”

Figure 18. Twitter post by Ennius. “The Zoom meeting of Arts and Sciences.”
29 January 2001.
In this way, the very ways of knowing and accessing scientific information also came into focus as a subject in itself. No longer perceived as an “us” versus “them”, the past and its images became tools for engaging with our current situation by situating it into perspective, while providing us with empathy for our ancestors and increasing our historical knowledge.

Figure 19. Image showing the Church of San Francisco in the city of Bogotá during the Spanish Flu pandemic. Displayed on Instagram as part of the interactive online exhibition curated by the Museo de Bogotá (Colombia) titled “¡No es la peste! La gripe de 1918 desde el presente” (April 2020).
Relying on the combination of visual and textual synthesis, infographs have also been used for showcasing the differences between earlier pandemics and our times. The infograph produced by Visual Capitalist used two comparative tools based on relative size and perspective, not unlike the strategies of pictorial composition. First published in March of 2020, the infograph has undergone continuous updating. As noted by Jaskot, while the image emphasizes the scale of death, it leaves out the causes and specific contexts. Indeed, the infograph intends to show the relative size of the different pandemics throughout time by positioning them on a perspectival timeline, and then again by placing them next to one another, in a similar fashion to the models used to show the relative size of planets. Rather problematically, as sometimes occurs in the gaussian graphs invoked by the media, it includes absolute numbers but leaves out the density of the respective populations. In this regard, the numbers are not comparable.

With regards to the representation of other, ongoing pandemics, such as AIDS, which is caused by the Human Immunodeficiency Virus (HIV), figures and graphics about AIDS are less familiar for most of the population, while information on COVID-19 is broadcasted and shared on a daily basis around the globe. So far, COVID-19 has claimed the lives of 2.8 million people; vaccines were developed in record time and have been distributed globally. On the other hand, almost 1 million people have died from AIDS per year since 1995, with almost 2 million deaths per year between 2004 and 2008, a total of ca.35 million, and no vaccine is available yet. Once again, a global/local perspective may explain the difference in terms of representation: while artists such as Keith Haring (1958–1990) raised awareness and brought the very issue of the representation of the virus into the spotlight in the 1980’s, the ways in which images have circulated in the main media still give way to the false perception that AIDS is constricted to specific parts of the globe or groups of people, when in fact it is not.

5. Conclusions
In some contexts, such as Latin America, the images of the virus arrived before the actual virus itself. One might speculate that these images not only had a predictive function, but that they allowed for some degree of psychological preparation and, as was the case for diverse communities throughout the world, served to make sense of this overwhelming experience in a number of ways. On the one hand, images are didactic tools: varying versions of scientific representations of the virus made their way into local media and official institutions with the purpose of educating their audiences and citizens. Almost immediately, these were translated into popular forms of graphic imagery, such as memes and caricatures, which circulated worldwide through social networks and which in some specific cases may be understood as forms of resistance, but also as an acceptance of a new reality, where repetition paves the way for the assimilation of an otherwise insurmountable amount of new and unexpected information. Many of these images were not only translated into multiple languages, but adapted to address specific local issues.

Likewise, certain trends are identifiable at specific moments of the pandemic: the use of graphs as didactic instruments, but also the proliferating representations of art works in diverse forms during the first months of lockdown. Some of the digitally circulating art works are related directly or indirectly to the iconography of the pandemic, but many are also unrelated, and their function may be more widely understood as the ability of art to convey a deep sense of humanity. On the other hand, scientifically-originated images were not only transformed and assimilated through what may be seen as subversive forms of visual language, but they relied on artistic choices in order to visualize their subjects, whether it be the actual virus or its effects, such as contagion, disease or death. Although the reliance of scientific illustration on artistic traditions is common practice, the ways in which scientific and non-scientific images have intertwined with one another throughout the Covid-19 pandemic marks an unprecedented sharing of imagery on such a scale. A year into the pandemic, this retrospective analysis of the iconography surrounding Covid-19, along with an exacerbated consciousness of the uses and effects of digital media, reflects on the power of images and their participation in the multilayered narratives that attempt to make sense of the pandemic on a daily basis.
Funding
Research program Universidad de los Andes, Colombia INV-2020-105-2055 awarded to Martha Josefina Vives, Research Fund from the School of Sciences, Universidad de los Andes.

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Citation information
Cite this article as: Visual representations of the COVID-19 pandemic and its iconography on a local/global scale: Crossing borders between scientific and non-scientific imagery, Patricia Zalamea, Martha Vives & Ferney Rodríguez, Cogent Arts & Humanities (2022), 9: 2055710.

Notes
1. For updated data on numbers of cases and infections rates see: https://www.worldometers.info/coronavirus/
2. Jaskot (2020). Recent studies that analyze the uses and effects of diverse media employed in the representation of Covid-19 include Ehrlich (2021, October) and Abdullah (2021, December)
3. Sonnevend (2020).
4. Introduced by Richard Dawkins in his renowned The Selfish Gene (1976), the term meme was likened to biological genes, able to replicate and be transmitted. For a full definition, see: https://www.britannica.com/topic/meme
5. We gave an online talk about the iconographic categories and their chronology in November of 2019, which was then turned into a divulgation article titled “Iconografías covidiáneas: el imaginario de la pandemia del 2020 visto desde la perspectiva de la historia del arte, la física y la microbiología,” Hipótesis n. 23 (2021): 2–15
6. The first photographs of SARS-CoV-2 appeared in this article: Zhu et al. (2020, February 20)
7. Jaskot, “Digital Art History in a Time of Barbarism: The Iconography of COVID-19”
8. It should be remembered that worldwide internet access is actually limited to roughly 59% of the population, while more than 80% of the population in developed countries has access. For more detailed information, see, Rosser et al. (2015)
9. On the fragility of public support for government measures, see for example, Peretti-Watel et al. (2020). See, also: Tso and Cowling (2020, October 15)
10. Sonnevend, 451.
11. Cheng et al. (2020, April 16).
12. Elyatt (2020).
13. On David Bokeh’s work, see: https://culturainquieta.com/es/arte/arte-digital/item/16626-david-bokeh-pone-en-cuarentena-a-las-protagonistas-de-pinturas-iconicas.html See also: https://davidbokeh.com/pandemiarte
14. Sonnevend, 451.
15. Sonnevend, 451–452.
16. Konstantinov et al. (2011, February).
17. Hierholzer and Kellington (1996).
18. See Ivan Konstantinov et al.
19. See for example, the 3D rendering of the influenza virus, by Visual Science https://www.visual-science.com/projects/influenza-illustration/ or the didactic visualization on the HIV life cycle produced by HHMI Biointeractive: https://www.youtube.com/watch?v=PS5xylUlhw
20. On the Ebola poster produced by Visual Science, see https://visual-science.com/projects/ebola/poster (03.02.2012). Accessed 03.30.2021. On the production of the 3D model of SARS-CoV-2 (Covid 19) see, Giorno (2020, April 1; updated 9 October 2020) and Brit (2020, May 13).
21. Jaffe and Haarhoff (2002). See also, Hodaliska (2016).
22. See https://ourworldindata.org/mortality-risk-covid
23. For examples of the visual culture surrounding Ebola, see Paul Mullins, “The Materiality of Virus: The Aesthetics of Ebola,” https://paulmullins.wordpress.com/2014/11/26/the-materiality-of-virus-the-aesthetics-of-ebola/
24. Sonnevend, 453–454.
25. Gaiter (2020, April 9).
26. Giorno (2020, April 1; updated 9 October 2020).
27. On the varying functions and practices of image making, see, Freedberg (1991). For a discussion on the connections between images and emotion, see, Joffe (2008), which also includes a section on the representations of the Ebola virus.
28. Indeed, some of the vendors publicize these as didactic and educational toys: https://www.giantmicrobes.com/us/ See also: https://www.freep.com/story/news/nation/2020/03/28/coronavirus-covid-19-giantmicrobes-plush-toy/4997846002/
29. Jaskot, “Digital Art History in a Time of Barbarism: The Iconography of COVID-19”
30. See for example, Chang (2020, March 20).
31. See the continuously updated Coronavirus World Map: Tracking the Global Outbreak as well as the consecutive display of graphs by country in “Which Country Has Flattened the Curve for the Coronavirus?” presented by The New York Times.
32. On the social role of the “flattening the curve” graphs, see: Sonnevend, 454.
33. Weinberg (2020, July/August).
34. See for example, the powerful image with the contrasting, yet fading red and yellow colors, in Roberts (2020, March 13).
35. On the unequal conditions of quarantines in countries that cannot afford them, see, Galindo (2020, August 25).
36. Developed at the School of Sciences at the Universidad de los Andes, by Juan Pablo Mallarino, Luis Anibal Garcia, Martha Vives and Ferney Rodríguez in 2020 (in process of publication).
37. On the posters created by the Ministry of Culture and the Information Policy of Ukraine, see: https://plaimagazine.com/art-of-quarantine-looma/ See projects such as Quarantmart, as well as the Getty initiative. Other private initiatives are noted by Raisa Bruner in “How People Imitating Masterful Paintings Launched a Sweeping Trend From Italy to Iceland,” TIME (10 April 2020).
38. See, also Katz (2021, August).
39. See, Searle (1980).
40. On the Early Modern conceptualizations of pictorial space as windows and mirrors, see, Brockelman (2013).
41. On the aesthetics behind the new uses of these platforms, see, Carrión (2020), 9 de mayo de 2020. For another reflection on the focused scenes that feature on Zoom and other such platforms as a “simulacrum of intimacy,” see, Greenberg (2020, April 23). https://www.theguardian.com/society/2020/04/23/therapy-during-coronavirus-pandemic-lockdown-psychoanalysis-freud.
42. See for example: https://www.history.com/news/pandemics-lessons
43. The interactive online exhibition curated by the Museo de Bogotá (Colombia) was titled “No es la peste! Lo griepe de 1918 desde el presente.”
44. Horgan (2014).
45. Pino Camps (2012; Gervasetti, 2021, January 9).
46. See the collected images at: https://buchettodelvino.org/home%20eng/news-so.html
47. First published in: https://www.peterfisk.com/2020/03/a-history-of-pandemics-from-the-antonne-plague-to-black-death-spanish-flu-and-covid-19-how-disease-has-shaped-society-and-healthcare/
48. https://ourworldindata.org/hiv-aids
49. Rosello (1998)

Disclosure statement
No potential conflict of interest was reported by the author(s).

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