# From Plague Doctor to PPE: A Brief History of Pandemic Protection Gear

## Video Transcript

Because desperate times call for desperate fits of curiosity, in which one has no choice but to appease said wondering by flinging oneself down a hole of internet research, I felt there was no more apt way to spend my quarantine days than to explore precisely how our stalwart front-line fighters went from four humors and funny masks to sterilization and fit-test approved P.P.E. But, if you were expecting me to open *The Booke of Pandemic Fashion History* to the year 394 A.D. and dive right into a world of plague doctors and iconic bird masks, well, you might want to put the kettle on and grab a snack, because our little medico-friend doesn't come into the picture quite yet.

In order to understand what our front-line responders might have been wearing to protect themselves from infections, or miasmas, or the wrath of God, we'll have to first look at the time period and culture surrounding some of the more prominent pandemics and epidemics in human history. So, our first stop puts us in Constantinople in approximately the year 541 A.D., by no means the beginning of human, and thus pandemic, history, but is said to be the first recorded significant outbreak of the Black Plague in Europe. More tea on this Black Plague business to come anon, believe it or not. This notable appearance was known as the Plague of Justinian and lasted until roughly 750 A.D. Which, can we just acknowledge how much time that is to hypothetically have to spend social distancing?

The Black Plague is caused by Yersinia Pestis, and is spread by infected fleas carried by rats, and equally transferred from person to person. But as medical science of the time was not yet aware of how exactly disease was spread, and one contemporary account effectively affirms that such things as these plagues are, "Sentences by God, which cannot be "understood or comprehended by human beings," there weren't yet sartorial measures taken towards protecting oneself in the presence of the sick.

Paintings and illustrations depicting times of plague all tend to show victims in the presence not of doctors, but of religious figures, who are appropriately dressed in religious garb. No masks, no gloves, nothing really more protective that yon godly raiment and sheer force of faith or something.

Oh, and I also want to point out the fact that these scenes often depict masses of people surrounding the victims because like, who needs self-isolation? Which is extremely curious, considering there's actually a reference as far back as the Christian Bible to the practice of isolating diseased individuals. So, as with all human-produced primary evidence, there may or may not have been a degree of artistic license involved.

Which brings us to the second significant outbreak of the Black Plague, in the 14th century. While infectious disease spread and prevention still wasn't scientifically understood by this point, the correlation between human proximity and the spread of disease was becoming slightly better understood. And the concept of isolating the sick was beginning to be put into practice, as evidenced by the introduction of quarantine laws in Venice, initially a term of 30 days, or *trentino*, to *quarantena*, a period of 40 days, during which the residents of incoming ships suspected of carrying disease would need to be isolated, to prevent contagious disease from being introduced to the mainland.

But while #SocialDistancing was starting to become a thing, we still don't see much of any evidence for personal protective equipment. So, nope, no aesthetic plague doctor masks yet. Most artistic depictions of those attending the ill are still of religious figures in religious garb, or civilians working to bury victims, all with zero face or hand protection.

But even depictions of apparent actual physicians, as late as the early 16th century, which I unfortunately cannot show you here, since this 500 year-old document is somehow not in the public domain, but is linked down below if you are curious, show these figures dressed in respectable early 16th century fashion, with, once again, no form of face, hand or body covering. There is, however, this circa 1340 image, depicting a team of civilian workers apparently burning clothing belonging to the victims of the plague. Evidence for the understanding of contamination, conceptually, although once again the lack of any hand or facial protective equipment in the handling of said contaminated garments should also be noted.

Plague doesn't really go away, and significant outbreaks continue throughout the 14th, 15th and 16th centuries. And it isn't until the outbreaks in the 17th century that we finally start to see evidence of the infamous plague doctor appearing as we know and love him today.

The middle of the 17th century, most notably round the 1660s, saw another substantial outbreak of the plague. The 1665 appearance in London becoming known as the Great Plague of London. But cases of plague were significantly prevalent all throughout England, as well as during the previous years all throughout Europe. Londoner Daniel Defoe's "Journal of the Plague Years" cites a particular increase of cases in Amsterdam and Rotterdam two years previously in 1663 as the precursor to the London outbreak. Which perhaps explains why so many of the earliest physical surviving masks attributed to plague prevention, as well as the illustrated depictions of such objects, originate in the Germany/Netherlands area.

The plague doctor suit, as we sort of (?) know it today, is attributed by medical historians as having been invented by chief physician to King Louis XIII, Charles de Lorme in the early 17th century. And while supposedly no description of this suit exists in de Lorme's own words, its invention is nevertheless attributed to him in an account by Michel de Saint Martin several years after his death. The suit is described as having consisted of a beaked mask, filled with perfume, with two spectacles over the eyes. Under a protective coat is a suit of goatskin, the britches for which are attached securely to the boots.

The suit is intended to protect the wearer from disease, according to Miasma Theory, or the theory stating that contagion is spread through "bad airs" produced by decay. The sweet-smelling perfume stored in the beak, or "good airs", along with the heavy, sealing quality of the outer garments, protected any surrounding "bad airs" from leaking through to be inhaled by the wearer. Which, if you know a thing or two about modern P.P.E., this is a rather haunting level of foreshadowing to the process of fit testing.

Now, let's take a moment to unpack this exceedingly well-known image, the image for which plague doctor costumes of today tend to be based on, and the image which tends to grace every informational, or otherwise, page pertaining to Black Plague. And although this image is often falsely linked to the 14th century outbreak of the plague, thus falsely suggesting that these bird masks were relevant, and somehow prevalent, in the medieval period, we can immediately tell that this is not the case from the shoes. Those Louis-heeled, bow-tied, square-toed styles quintessential specifically to the mid-17th century. 14th century shoes, on the other hand, looked something more like this. Or this. Or this.

But if we want to be less pedantic and more practical, the date of creation for this engraving by German publisher Paulus Fürst is around 1721, roughly 60 years after the mid-17th century outbreak. It's intended to depict a 17th century Roman plague doctor to accompany a satirical poem, rendering this not only not primary evidence, but also extremely subjected to artistic interpretation.

While a suspiciously small quantity of actual garments attributed to plague doctor use actually survive, a couple of hooded masks do survive in German museum collections. They appear slightly differently from how we picture the masks today, but they do technically adhere to de Lorme's supposed description, featuring beaked noses made from leather, and with small glass spectacles at the eyes.

In fact, the majority of plague doctor illustrations and engravings floating about the internets today actually date several decades, if not centuries, after de Lorme's alleged introduction of the suits, suggesting that, while indeed present in the 17th century, the iconic image of the plague doctor as we know him today, wasn't actually popularized until the 18th century. That's right, 21st century front-line responders, prepare to be thoroughly romanticized in full N95 glory in about a hundred years time.

So, where do we get the idea that historical plague doctors all looked like this? Perhaps we have the commedia dell'arte character il Medico della Pesta, and Venetian Carnevale to thank for the artistic interpretation and subsequent popularization of the plague doctor figure.

Herein, however, is where we enter into the realm of medical representation in art, rather than within the context of actual pandemics, thus where the focus diverges into aesthetic, rather than to actual practical application.

So, it is time now for us to depart from plague doctors, and proceed into the beginning of the 20th century, where we encounter the outbreak of the Spanish Influenza in 1918. Spanish flu, according to the CDC, was the most severe pandemic in modern human history, killing an estimated 50 million people, and infecting around 500 million worldwide.

Germ Theory was by now widely accepted, having gained popularity throughout the latter part of the 19th century, and such protective measures as disinfecting, personal hygiene, quarantine, and limitation of public gatherings were readily put into place.

Images depicting scenes of illness and treatment at this point almost ubiquitously show healthcare workers wearing masks, head coverings, and designated uniforms or garments other than regular street wear. It was understood at this point that infection was spread by "Moist secretions from the nose and throats "of infected persons." And so, not only healthcare workers but civilians as well were encouraged to adopt, or make if necessary, face masks.

Methods of disinfecting after contamination were also developed, with advice to boil contaminated items at the very least, or to use soap to disinfect, or literally, "save lives," as some advertisements liked to boast.

Viruses, including the H1N1 strain that caused the Spanish flu, couldn't yet be seen, until the invention of the electron microscope in 1931. So testing and further study were not yet possible during the 1918 pandemic.

Despite the substantial increase in scientifically supported prevention methods, healthcare workers were still catching the virus at alarming rates, to the point where one Colorado nurse writes that at her institution they had, "Hardly enough staff to keep the wards going." She herself continued working despite contracting the flu.

Which brings us to the year 2019, and the first appearance of ye olde novel coronavirus, which will proceed to flip the world upside-down completely in 2020. We've come a long way since the days of Justinian plague. Rather than relying on religious leaders to appeal to God to lighten up the wrath a little, we have likewise such useful innovations as masks, and social distancing, and science to hopefully flatten curves in a matter of months, instead of two centuries.

As far as science and modern germ theory understand, the safest way to prevent contagious disease is through limiting contact with infection or eliminating the contagion altogether with antiviral and antibacterial cleansers, but we've known this since the 19th century.

What we have learned since 1918 is that our Miasma Theory friends actually did have something right. The concept that if a scented particle can be detected despite wearing the protective gear, the protection is not entirely effective and the wearer still has a chance of being infected. We can measure the filtration efficiency of various fabrics and materials nowadays to determine which materials are best to protect workers coming into direct contact with contagion, and fit tests, such as the one demonstrated by my fellow CosTuber and healthcare professional, Sewstine in her mask making and fit testing video, to test the efficacy of mask fit. When fitted properly, a mask will not allow the deliberately scented particles to pass through to the wearer's nose, although in this case, even sweet airs can mean infection from plague. Sorry, Miasma Theory.

In addition to fit-tested masks, our front-line first responders also equip themselves—

Wait, how many of you are actual healthcare professionals, watching this like, "Yes, please do tell me all the things "that I already wear"?

Ok, well front-line workers will also wear, or would also wear if shortages weren't a thing, a gown over regular scrubs, two pairs of gloves, a cap and a face shield, ideally at the very least. Protection from highly dangerous materials, including biological contagions, can also of course extend to the hazmat suit, a completely enclosed garment of varying levels of protection depending on the hazardous subject to be handled. These also generally include a breathing apparatus, to provide the wearer with safely breathable air.

So, while 2020 has proven that we humans are still no match for the might of a pandemic, we have at least come quite a ways from Black Plague times.

However, I think it's important when looking back at the development of a subject throughout history not to criticize our forebears for the things that they didn't know. After all, we are only where we are today through our ability to look back and learn from the past evidence, mistakes, and triumphs of those who came before us.

And who knows? Perhaps historians will look back on the COVID-19 outbreak 200 years from now, if humanity even exists at that point still, and point out every detrimental and terribly obvious thing that we are unwittingly doing wrong today. So, I suppose that while we historians consistently assure ourselves that we are not out here trying to cure complex diseases, I suppose we are out here studying all the ways not to cure complex diseases.