

Module 1 - Vaccines are here: Now what?

[00:00:10] **Maryn Mckenna** Hello. Welcome to the first module in this course. Covering the COVID-19 Vaccines, What Journalists Need to Know. I'm Maryn McKenna. I'm a journalist, an author, and university science writing instructor in Atlanta.

[00:00:27] I'm the course leader and the instructor in English. Over the next four weeks, you may also meet the associate instructors. Yves Sciama, for the Francophones, André Biernath, who will handle the course in Portuguese, and Federico Kukso, who conducts the course in Spanish.

[00:00:46] On behalf of all of us, thank you for taking this course. Let me tell you a little about how this is going to work. This course is designed to explore the achievement of vaccines to end the COVID-19 pandemic and turning those vaccines into vaccinations, protection delivered into arms.

[00:01:09] In every module of this course, we're going to examine one aspect of this effort from the science that is achieved new vaccines in record time, to the logistics of delivering those vaccines around the world to the emerging problem of making sure vaccines are delivered equitably.

[00:01:30] We'll explore the massive problem of misinformation and disinformation, well-intentioned and also weaponized, and we'll try to predict what the world may look like after vaccinations are delivered and we begin to attempt to return to normal life. Our goal is to talk about the best story ideas and the best journalistic skills and practices to use right now.

[00:01:57] We understand this is a novel situation for all of us. Just a year ago, COVID-19 and the coronavirus causing it, SARS-coV-2, were completely new. Trying to inoculate the world to end a pandemic is also new, among other things, that means it is too soon for any history to have been written. The knowledge of what's going on is disseminated all over the world. Pieces of it are held in many places by many people.

[00:02:31] So every week, in addition to your instructors, we will talk to one or two experts who possess some piece of that widely disseminated knowledge. Some of them will be scientists in various disciplines, others will be journalists who've been covering vaccine science and the vaccination effort. One final note, those of you who are taking this course come from all over the world, that is thrilling and we're so glad you're here.

[00:03:01] But it also presents a challenge. Just as the pandemic hit different countries last year at different times, vaccines and vaccination also are arriving in a staggered manner. Some countries are well embarked on their vaccination efforts, others have barely begun.

[00:03:22] So, it's possible that some of the data we present you with or the story ideas we recommend may not be relevant to where you live right now. We hope you'll stick with us anyway to experience this community and read the work we're recommending. That's my introduction. Let's get started.

[00:03:45] **Maryn Mckenna** As journalists, we have a professional obligation to be skeptical, but it's difficult not to be just astonished, maybe even joyful, about how quickly coronavirus vaccines got to market.

[00:04:02] **Maryn Mckenna** You probably all remember these dates, but let's go over them just in case. The day that the world outside China learned that a mysterious respiratory disease was spreading was December 30th, 2019. The cause was identified as a novel coronavirus on January 9th last year.

[00:04:24] The international death toll hit a thousand on February 3rd and the worldwide case count reached 100,000 on March 7th. Just four days later, on March 11th, the WHO declared COVID-19 a pandemic.

[00:04:40] On April 2nd, cases surpassed a million. It would take until September for us to get to one million deaths.

[00:04:50] Now, of course, we're at many times those numbers on the day I'm recording this, the global case count is about to cross 115 million cases, and the toll of deaths worldwide is more than 2.5 million. By the time you view this, those numbers are likely to be much higher.

[00:05:14] **Maryn Mckenna** From the start, medicine threw everything it had at this new disease to try to save victims lives. The most advanced ICU treatment, every possible antiviral drug, antibiotics for secondary infections, even though we know that antibiotics don't affect viruses.

[00:05:35] A slew of existing drugs that someone thought might help. You might remember the arguments last year about hydroxy chloroquine, and remdesivir, and ivermectin, none of which really turned out to make much difference at all.

[00:05:51] But it was also clear from the start that what we were going to need was a vaccine. It was clear, because none of the treatments that medicine tried were doing very well, and it was clear because only vaccines prevent illness and prevention is almost always a better goal than treatment is.

[00:06:12] I think we forget how powerful vaccination is, all of us participating in this course were born within the era of routine vaccination.

[00:06:22] 28 diseases that occur in humans are prevented now because of routine vaccination, either in childhood or in adults or both. Those include rabies, polio, rotavirus, meningitis, mumps, measles, whooping cough, flu, and smallpox - the only human disease ever eradicated, completely wiped out as a result of vaccination.

[00:06:52] **Maryn Mckenna** In fact, it's prevention of smallpox that starts us on the journey to routine vaccination in 1796, Edward Jenner showed that he could protect an eight year old boy against smallpox by scratching pus from a lesion from a related disease, cowpox, into the boy's arm.

[00:07:14] Across the 19th century, countries individually decided to require that vaccine, and this is what the impact of smallpox vaccination was in the 20th century, up to the point where smallpox was declared eradicated in 1980. The impact of vaccination has been just as dramatic, even for diseases that we haven't eliminated yet.

[00:07:40] This is what the incidence of polio has looked like around the world since the international campaign against it began in the 1980s. And this is what measles looks like in

the United States since the vaccine was made mandatory in 1960. So you can understand why science immediately turned to the idea of a vaccine against COVID-19.

[00:08:10] **Maryn Mckenna** Last spring, as the coronavirus was spreading around the world, to achieve a vaccine rapidly seemed almost impossible. On average, it takes 10 to 15 years to get a vaccine from first concept through to approval and distribution. The shortest vaccine development on record is for the mumps vaccine, that took four years.

[00:08:34] But various research groups thought it was worth a try, and they also thought there might be preexisting research that could give them a head start. The German company Bio N Tech, which later joined forces with the U.S. company Pfizer, began work on its vaccine formula last January. So did the U.S. company Moderna. In May, the Chinese company Cansino Biologics published the first human trial results of its vaccine.

[00:09:05] In June, another Chinese group, the Beijing Institute of Biological Products, had its first results in monkeys. And in July, Moderna and Johnson & Johnson published their first results in monkeys as well. Pfizer and Moderna vaccines were authorized for emergency use by the U.S. Food and Drug Administration in December.

[00:09:28] In that same month, the United Kingdom approved the Oxford AstraZeneca vaccine. But meanwhile, shots were already being given in parts of the globe, China began inoculating government officials and company executives as early as July. And in November, the Russian government began vaccinating people with its Sputnik V vaccine.

[00:09:54] That is a lot to keep track of, different companies, different formulas, different timelines.

[00:10:02] **Maryn Mckenna** But overall, at the point at which I'm recording this in early March, 78 vaccine formulas are under investigation in animals and 71 have already gotten to various stages of clinical trials in humans, 20 of those are in the final stages of testing. Eight vaccines have been allowed to go into limited use by regulatory authorities in some countries, and four have gotten all the way through internationally accepted standards for assessment and approval or emergency authorization.

[00:10:39] In other words, a little more than a year from the start of the pandemic, 12 vaccines have made it through some or all the stages of human clinical trials. That is extraordinary. Let's be sure we understand what that means. A clinical trial conducts a new drug, and a vaccine counts as a drug through several phases.

[00:11:07] **Maryn Mckenna** From phase I, which uses only a few people and tests only for the safety of the compound. Through phase II and then phase III, in which the drug is given to hundreds and then thousands of people to see whether it will work as its creators say it will.

[00:11:27] The major national drug licensing agencies, those are, for instance, the U.S. FDA, the European Medicines Agency, the Central Drugs Standard Control Organization in India and the National Medical Products Administration in China, often ask to see further studies after a formula is approved and allowed to be marketed.

[00:11:50] That's called phase IV. Phase IV looks for any long term problems with safety and effectiveness in the people receiving the new vaccine. And that's especially important for vaccines, because unlike a pill, you can't just stop taking it. Once it's administered, it's

in your body. It's not reversible, and there are cases on record of severe vaccine reactions happening, only being discovered at rates of one in 100,000 or one in a million.

[00:12:24] This happened, for instance, in 1976 in the swine flu vaccination campaign in the United States, where 45 million doses of a new flu vaccine were given, and about 500 people developed a trenchant paralysis afterward. So, long-term monitoring of vaccine recipients is important. On how that occurs is going to be very different from country to country, but we'll help you figure out how it is occurring where you are.

[00:12:57] **Maryn Mckenna** It's important to say at this point that the vaccines that have been approved or authorized are not all the same. Several of them use what is called messenger RNA, which is genetic material that provides our own cells with instructions on how to make proteins.

[00:13:17] The material in the vaccine carries instructions on how to make the protein that the coronavirus uses to enter our cells. Once that protein is made, our immune systems learn to recognize it and then they recognize the actual coronavirus when it infects us.

[00:13:38] That's a super simple explanation. Other vaccine formulas insert genetic material inside another virus, usually an adenovirus, which is one of the array of viruses that cause colds in the winter time. That engineered virus protects that inserted gene until it can get inside our cells and begin making the protein that our immune systems need to learn to detect. Yet other formulas use proteins assembled into nanoparticles, and another set use killed viruses that cannot cause disease.

[00:14:15] We'll give you references for these types and for which companies make them, but the key point is that vaccine formulas are different around the world. That's important to know because different formulas have different storage requirements, including the temperatures they have to be kept at, and those place limitations on how vaccines can be transported, especially in low-income countries.

[00:14:43] **Maryn Mckenna** Those differences are one reason, but not the only reason, why vaccination is rolling out at such different speeds all around the world. That's what we're going to talk about next week, the logistical demands of vaccination campaigns and the even more profound challenge of vaccine ethics and equity; ensuring that everyone around the world gets the same fair chance at a shot.

[00:15:16] **Maryn Mckenna** For now, please look at the readings.

[00:15:18] There are recommended ones and also optional resources and references, and visit the discussion forum where we'll pose questions to get you talking to each other.

[00:15:29] Thank you for joining us. Stay safe.