Dr. John Maassab, Public Health Pioneer

Unidentified Speaker: Today's children have no idea what polio is. That is a modern miracle. A disease older than the Pharaohs, one that indiscriminately crippled children for many millennia, has been all but wiped out. On April 12, 1955, in Rackham Auditorium on the campus of the University of Michigan, Dr. Thomas Francis, Jr., announced to the world that the polio vaccine developed by Dr. Jonas Salk was safe, effective, and potent.

Thomas Francis, Jr.: The vaccine could be considered 80 to 90 percent effective against paralytic poliomyelitis.

Unidentified Speaker: The scourge of polio had ended. In the audience that day was a graduate student who had worked on blood samples for Salk's polio vaccine trials. His name was John Maassab and he was destined to continue the University of Michigan's School of Public Health tradition of leadership in vaccine research. Maassab was born in Damascus, Syria on June 11, 1926, a jeweler's son. After graduating from a Greek Orthodox high school in 1945, he came to America to study, first at the University of Missouri and then at Michigan. Maassab decided to get a degree in Public Health. Working under the tutelage of Dr. Francis, he received his Masters in Public Health from Michigan in 1954, and two years later earned his PhD in Epidemiological Science, the study of the causes, distribution, and prevention of disease in populations. His doctoral dissertation was on influenza. Dr. Maassab's interest

in flu was triggered by accounts he'd heard as a child of the pandemic of 1918; a deadly global outbreak designated the Spanish Flu, and responsible for the deaths of more than 20 million people worldwide. Influenza was to become Dr. Maassab's lifelong dedication. His early research focused on the pathology of viral diseases. This helped shape his later work on vaccine development. A virus is an infectious agent found in virtually all life forms. A tiny bundle of genetic material surrounded by a protective coating of protein. It is more than 100 times smaller than a bacteria cell and must use other living cells in order to propagate. The flu virus is airborne, spreading when a carrier speaks, coughs, or sneezes, filling the air with microscopic flu particles inhaled by others. New strains of influenza emerge every year. In the United States alone, flu attacks 35 to 50 million people annually, killing 20,000. The related costs of each outbreak are estimated at $4.6 billion. Those at highest risk are young children, adults over 65, and persons of any age with underlying medical conditions. The flu virus mutates quickly, often producing new strains. Jonas Salk's teacher and mentor, Dr. Francis, became Dr. Maassab's mentor as well. In 1933, Francis had been the first American scientist to isolate influenza virus, the cause of the 1918 epidemic. In 1944, he conducted final, successful tests on the first flu vaccine ever used. Many followed in its wake, but none were completely effective. Dr. Francis encouraged Maassab to develop a live, attenuated, influenza vaccine. Dr. Maassab decided to use the process of cold adaptation to attenuate the influenza virus.

Rosemary Rochford: As a virus cold adapts, it can grow at lower and lower temperatures. This is important because the nasal passages are at a lower temperature than the lungs. The nasal passages are at 33 degrees Celsius, and this is where the cold-adapted virus can replicate and generate an effective immune response. In contrast, the lungs are at a higher temperature, which is 39 degrees Celsius.

Unidentified Speaker: The immune response stops the influenza virus in the nose, where it typically enters the body, and prevents the virus from traveling to the lungs where it can cause disease.

Rosemary Rochford: There are two types of vaccines: either a killed virus vaccine or a live attenuated vaccine. The killed virus vaccine is effective, but it doesn't generate as good of immune response in a larger percentage of the population. In contrast, the cold-adapted vaccine developed by Dr. John Maassab generates a good immune response in a large percentage of the population, and especially in children.

Unidentified Speaker: However, as Dr. Maassab was always careful to point out, using a live virus instead of a killed one is a far more complicated process, but once a vaccine is developed it's there for life and can be produced economically, grown in chicken eggs. Dr. Maassab published his progress in journals. By 1960 he had isolated the type "A" Ann Arbor influenza virus, which he used to create the cold-adapted live influenza virus. This virus grew well in cooler nasal passages and didn't mutate to more dangerous forms. Over

the next 20 years, Maassab worked with scientists at the Laboratory of Infectious Diseases in the National Institute of Allergy and Infectious Diseases to refine the cold-adapted virus for use as a vaccine, and prove it was safe and effective for humans. More than 9,000 volunteers received the vaccine in over 70 clinical studies; all of which demonstrated its efficacy. In 1995, the University of Michigan licensed the vaccine technology to Aviron, a biopharmaceutical company. By 1997, the vaccine, which would be marketed as Flu Mist, had been proven to be 93 percent effective in a major study of 1,602 children in 10 centers across America.

Kenneth Nisbet: The agreement that we had with Aviron is quite beneficial to the University of Michigan, and also quite typical of tech transfer agreements, in which they have taken the rights for commercialization and in return we receive benefits. In fact, if we wouldn't have that connection to the marketplace, no one would be using the technology. It would undermine the whole reason for doing research in the first place.

Lee Bollinger: The University of Michigan invests hundreds of millions of dollars every year in basic research. Much of that is in scientific and medical research. We are deeply, deeply committed and interested in seeing to it that whatever can transfer from the University into the commercial and medical realm happens. This is really our discovery and it will be, in part, our product. The most important point is that this stems from fundamental research by a dedicated researcher and a team of people over a period of many decades. It

is a commitment of a university to make sure that the practical benefits of its research are felt by the public.

Unidentified Speaker: The key to the vaccine's success is adaptability.

Rosemary Rochford: The core virus can be stored until a new epidemic breaks out and then retrofit it with an outer covering of the virus that's causing the epidemic for that year.

Unidentified Speaker: And Flu Mist is administered easily through the nose, the first line of defense against flu.

Noreen Clark: Public health is a collaborative activity. It requires people from all sectors to come together and find solutions to difficult problems, and the Maassab vaccine involved virologists and microbiologists, epidemiologists, even attorneys who saw the process through the legal channels necessary to make it widely available.

Unidentified Speaker: The University of Michigan School of Public Health has given the world, and especially its children, another pioneering vaccine to make lives safer and better.

Noreen Clark: People don't understand how much devotion and commitment it takes to bring an idea to a scientific reality, and John Maassab has been so devoted to his work; his career spans over 40 years. When this vaccine is broadly available, thousands and thousands of lives will be saved every year.

Unidentified Speaker: The young student who in 1955 witnessed the making of public health history by Jonas Salk and Thomas Francis has gone on to make public health history of his own.

Lee Bollinger: Dr. Maassab has accomplished something here that everyone of us who have dedicated our lives to being faculty members at this institution and across the country admire and respect, and we live off of great discoveries like this in the sense that none of us knows when we take on a great research project how it will end, and his taking at an intellectual level that I think really is proven here. The importance of people trying to simply advance our understanding of life, and then good things come from it, and here we have something that's really very good indeed.

Unidentified Speaker: From childhood in Damascus to the achievements of Ann Arbor, Dr. John Maassab has shown the world what a lifetime of patience, dedication, and careful work can do. The vaccine he has developed is a marvelous public health achievement. One that will save lives worldwide.