Week 3 Activities, Immunology.
Video -- RX for Survival: Heroes for Health

INTRODUCTION:
>> NARRATOR: (Brad Pitt, narrating.) Our world is still haunted by the specter of dangerous disease, and now 30-some new diseases that we have never seen before.
>> That is something that has been going on forever. This is not new.
>> Microbes know no boundaries. There is no risk so remote it can't affect us here.
>> Even ancient killers are staging a lethal comeback.
>> The fact is there are more people now infected with tuberculosis than at any other time in human history.
>> RX for Survival is the story of the greatest challenge today and of the men and women who are meeting them head on.
>> This is the ammunition for the war.
>> A latch-ditch effort to eliminate polio from the face of the planet hangs in the balance.
>> If we leave a single child out, we jeopardize the entire world. Really, it's that serious.
>> Strong antibiotics need to reach TB victims in Peru. But these drugs are harsh and difficult to take.
> We had to go and convince them, please, you need to continue taking your medicines because if you don't, you are going to die.

> And the stakes are even higher for Ernest Darko and the landmark program to save the people of Africa afflicted with HIV/AIDS.

> ERNEST: It scares me, frankly, to think about what will happen if we don't get this to work. I think we will lose arguably half the continent of Africa.

> The solutions, even to our most pressing problems, are being found every day --

> One, 7 a.m., one, 7 p.m.

> -- all over the world.

> An eye doctor from Baltimore discovered that two drops of Vitamin A can mean the difference between life and death for millions of children.

And a remarkable group of women is leading Bangladesh out of the depths of poverty and illness.

Wherever there is creativity, leadership and commitment, the landscape of global health is changing.

Coming next: "RX for Survival, the Heroes."

(Music plays.)

> NARRATOR: Major funding for "RX for Survival" was provided by the Bill and Melinda Gates Foundation, working to ensure that life-saving advances in health reach
those who need them most; and by:

>> WOMAN NARRATOR: Funding for "RX for Survival" is also provided by the Merck Company Foundation, working to enhance the health and well-being of people in the U.S. and around the world. Merck Company Foundation and Merck Incorporated work through a variety of companies and partnerships to help people with quality of healthcare to those who need them, regardless of their ability to pay. Merck, where patient comes first.

>> WOMAN'S VOICE: This program was made possible to your PBS station by viewers like you. Thank you. "RX for Survival, the Heroes."

>> NARRATOR (Brad Pitt): These are the heroes of global health, dedicated men and women working in difficult, sometimes life-threatening conditions, to protect the world's people from dangerous disease.

Some may be doctors treating the poorest of the poor or dedicating their lives to preventing illness from striking in the first place.

Others may be engineers who bring communities the gift of clean water.

Still others may be local volunteers, helping their neighbors stay healthy.

>> WOMAN: (Translated) I will give you medicine and you will be healthy again. Don't worry, I'll take care of you.
MAN: Thank you.

NARRATOR: But they are all champions for the public's health delivering life-saving interventions for those who may never remember just how much they've been helped.

In a world where new threats like SARS and Avian Flu occur with increasing regularity and where older diseases like malaria still bring death to a million children every year, the need for our global health champions has never been greater.

Here are eight stories of global health's unsung heroes whose perseverance and valor have saved millions of people throughout the world.

"TWO CENT HERO."

NARRATOR: Children play with water buffalo in southern Asia. Eight-year-old Sara Swati and her friend Parinda are just like the other children splashing around, but at dusk something strange happens to their vision. They become night-blind. As the world dims about them, they feel more and more isolated from their friends, unable to join in.

WOMAN: (Through translator.) What can you do with poor people? I have to feed her, take her everywhere. I just don't know how she's going to get a long life.

NARRATOR: By the time the sun sets, they are enclosed in their own darkness.

Scientists have known for decades that night blindness
like Sara Swati's is caused by a lack of vitamin A in the food she eats. Her meager diet, like most people in Asia, consists almost entirely of white rice, which has no Vitamin A; and without it, she is in danger of going completely blind.

Millions of the world's poor and malnourished children become night-blind. And this seems to be yet another unstoppable tragedy of the developing world.

Until it caught the attention of an eye specialist in Baltimore.

> DR. SOMMER: All right, David, I want you to put your chin right here on the chin rest.

> NARRATOR: Alfred Sommer is no ordinary eye doctor. For over a decade he was a public health physician, stationed in poor countries where he was naturally drawn to the plight of children with night-blind vision.

> DR. SOMMER: People in Bangladesh or Nepal literally can't fend for themselves. When the other children are walking around the village or playing with toys, these children will huddle in a corner.

> NARRATOR: The reason they can't see has to do with the rod cells in their eyes. Without Vitamin A, these cells can't produce a light-sensitive chemical called rhodopsin that helps us see in low light. If the condition goes untreated, the outlook worsens.

> DR. SOMMER: Then the children will go truly blind,
because what happens is the cornea, that clear front of the eye, just melts away, and it can melt away in the course of one day.

>> NARRATOR: In 1976, Sommer mounted an exploratory mission to see if he could find a practical way to prevent night blindness in children. He began his mission in Indonesia and for good reason.

>> DR. SOMMER: It's a place because of the nutritional choices and because of extreme poverty, night blindness has been extremely common.

>> NARRATOR: Although Sommer knew that night-blinded children can be treated with injections of vitamin A, this was an impractical solution in the developing world.

>> DR. SOMMER: In Indonesia and every other developing part of the world, where are you going to find a syringe and needle that is sterile? So it clearly has to be more practical, but it has happen at least as rapidly as the injection was.

>> NARRATOR: As he looked for a solution, Sommer began to wonder if just a few drops of vitamin A given orally would produce the same results.

   He tried the drops on a small group of children.

   The result was beyond Sommer's wildest dreams. Most children could see perfectly the very next day. Even more dramatically, those who came in on the tip of going blind with
corneal ulcers, suddenly heal where they would never have healed before. These children would have gone blind within a week.

>> DR. SOMMER: You carry these mental images of these little children that you directly treated. Now, that's where you get your great thrills as a clinician. You are treating somebody, and they get better.

>> NARRATOR: Now anyone can treat night-blind children without injections or trained medical staff.

But Sommer still needed to know how many children were at risk and how night blindness progressed over time, so he began a long-term study. Many months later, back in Baltimore, Sommer is poring over mountains of survey data where he notices something he never thought about.

>> DR. SOMMER: Suddenly it looked like something very funny was happening to the numbers.

>> NARRATOR: As he looked at the progress of the night-blind children, he saw that they were dying at an alarming rate, not from eye problem, but from typical childhood illnesses like measles and diarrhea.

>> DR. SOMMER: And no matter how you sliced it, the children who had night blindness had a much greater risk of dying before the next examination.

>> NARRATOR: This raised a remarkable possibility: Was the Vitamin A deficiency that caused night blindness also
making children weak and vulnerable to other diseases?

   >> KEITH WEST: Sometimes data, especially early data, can be like a whisper in your ear, and he hears that, and that's the difference between him and the next researcher down the hall.

   >> NARRATOR: To test his theory, Sommer assembled 20,000 more Indonesian children and gave half of them vitamin A. The other half got nothing.

   Two years later, the results were in: The children who did not get vitamin A were nearly twice as likely to die as the children who did.

   >> DR. SOMMER: I was blown away. It was wholly (shit)! I don't believe this!

   >> NARRATOR: Sommer's results were indeed stunning. Vitamin A could not only save children's sight. It could save their lives. He published his findings in the prestigious medical journal, The Lancet, and waited for the accolades to come in. But instead, the knives came out. The experts said he hadn't proved his case.

   >> DR. SOMMER: What was frustrating was when you went to meetings and you present this hard data, and people get up and say, that can't possibly be true. How do you deal with that?

   >> NILS DAULAIRE: There's this enormous resistance. Here's a physician, how does he know about
curing childhood diseases? There's the temerity of saying he has this simple capsule that has to be given only once every six months, and he could drop mortality? It was too good to be true.

>> NARRATOR: Frustrated and angry, Al Sommer now faced an uphill battle to critics that countless lives could be saved with just a cheap dose of vitamin A.

>> DR. SOMMER: This is a potentially lethal issue. There are children dying around the world, we are talking not about a few children, but about a million children or more.

>> NARRATOR: Certain he's right, Sommer fights back. This time, he chooses Nepal to prove his case once again. With the discipline of a military operation, a Hopkins/Nepalese team sets out to diagnose 30,000 children. But they hadn't planned on the skepticism of Nepali parents who were wary of the experiment.

>> BILL FOEGE: If a person came to me and said here's a drug I would like to try on your grandchild, you know you wouldn't agree with that.

>> NARRATOR: He knew what he was up against. Sukamaya was a critic of the strange capsules.

>> SUKUMAYA: When he first brought it to give my kids I was afraid because I didn't know what it was. What is this? Is this going to kill them?

>> NARRATOR: But Sukamaya's children were
themselves night-blind, and this gave the team the opportunity they needed. If vitamin A could cure Sukamaya's children, she might persuade other parents it was safe.

>> SUKAMAYA: I noticed after getting vitamin A the kids could see better, they seemed stronger, had more energy.

>> NARRATOR: Just like the Indonesian children, Sukamaya's were cured the very next day. She soon became an ally and persuaded the neighbors to let their children get dosed. Meanwhile, studies prompted by Sommer's findings offered one explanation for the critical role vitamin A plays in the body. Researchers noticed that children who did not get enough vitamin A had a weakness in the epithelial lining that surrounds and protects the body's organs. Infectious germs can breach this natural barrier when it's weak and attack vulnerable organs like the lungs.

This could easily explain why vitamin A-deficient children are so vulnerable to serious illness.

Not surprisingly, Sommer's trials in Nepal again proved that vitamin A could reduce childhood deaths by more than a third. The eye doctor from Baltimore had made a discovery for the ages.

>> DR. SOMMER: We said, Yes! There is no way people can ignore the data this time around.

>> NILS: All doubts were gone in my mind within a few weeks of starting to see the data come in. I had never seen in
my experience in working in public health this kind of dramatic impact.

>> NARRATOR: The government of Nepal immediately commissioned a vitamin A program for the entire country. Led by local leaders like Ram Phresta, the program is now reaching the vast majority of the children here. Initially Ram had no money to pay workers, so he appealed to the mothers and grandmothers of Nepal to help him.

>> RAM: You are the one who can save a child's life. It is very simple. You take your child to the center, give vitamin A capsule twice a year, that's it.

>> NARRATOR: He soon had a large volunteer army, including the once skeptical Sukamaya.

>> SUKAMAYA: I go all around the village and convince people and say you have to give your children vitamin A. They see better, they are healthier, they have a longer life.

>> NARRATOR: Ram also understood that in a country as large as Nepal needed a way to bring the children the vitamins rather everyone trying to reach every village and town. His solution? Rallies, complete with street theater and games as well as vitamin A for the children.

>> RAM: In two days, 46,000 volunteers gave capsules to 2.3 million children. That is very, very special.

>> DR. SOMMER: People will actually stop everything else that they are doing for a day, walk miles with the children
on their back or their arms so they can get that vitamin A. That's an extraordinary development.

>> NARRATOR: Today, most children in Nepal are surviving the normal health risks of childhood. As a result, similar vitamin A programs have been rolled out in 70 countries. It's estimated that they are currently saving a quarter million lives a year, thanks to Alfred Sommer and his two-cent miracle.

(End of Two Cent Hero.)