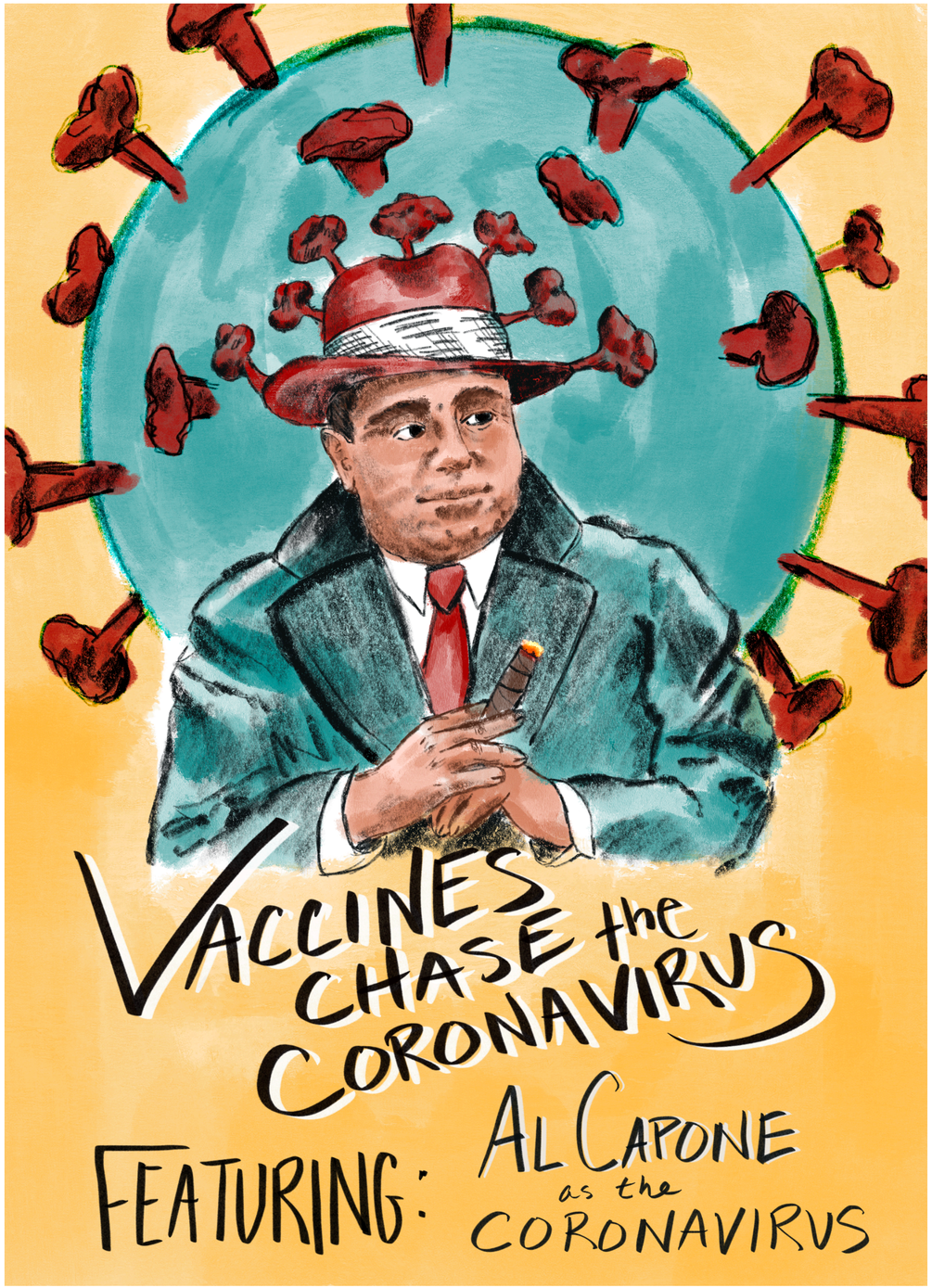
VACCINES CHASE THE CORONAVIRUS

starring

Al Capone

as the Coronavirus



Think of **Live Al Capone**
as **live SARS-CoV-2 coronavirus**.

Like detectives chasing criminals,
vaccines help us find and eliminate
viral threats.

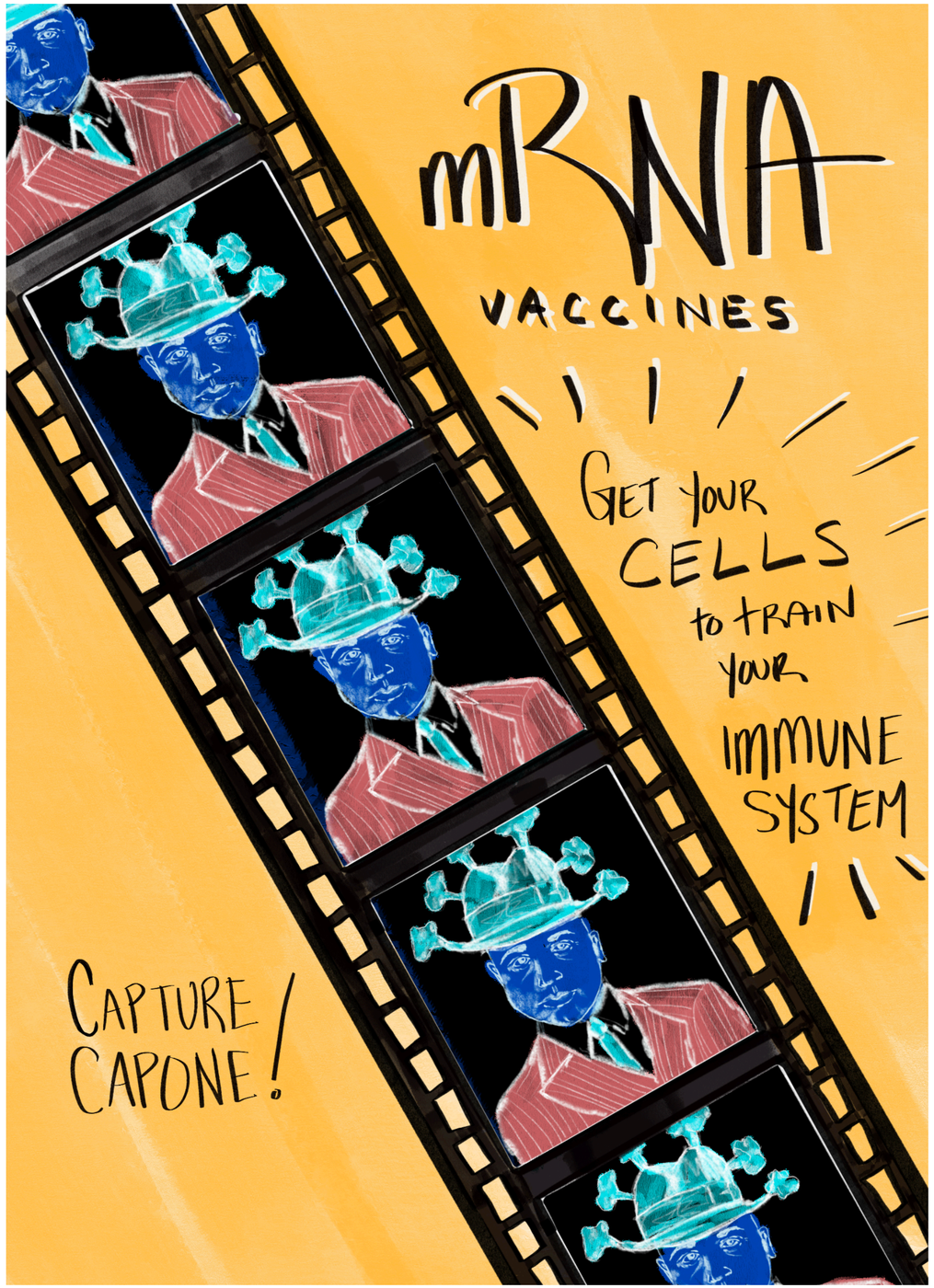
These mugshots of Al Capone are like **subunit vaccines.**

Detectives can identify Capone from these photos of him.

This is how **subunit vaccines** work. They're made of a fragment of the virus, such as a single protein. Your immune system sees that fragment and learns to nab viruses carrying that same specific fragment.

Examples of **subunit vaccines** include:

- Hepatitis B vaccine
- Human papilloma virus (HPV) vaccine
- Pertussis (whooping cough) vaccine
- Tetanus vaccine

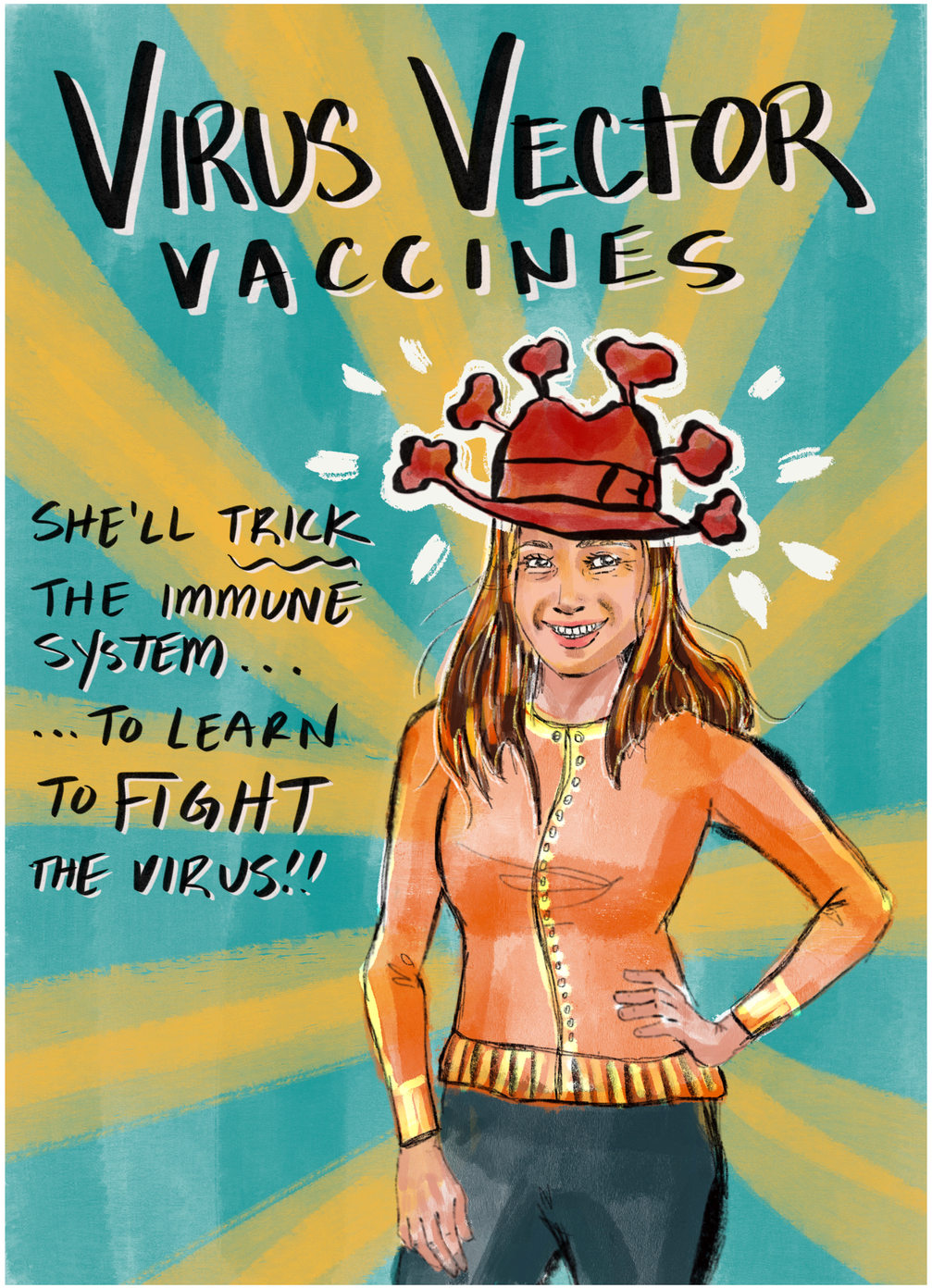


These film negatives of Capone's mugshots are like **mRNA vaccines**.

Detectives can print photographs of Capone that show what his face looks like.

Just like you can print photographs from a film negative, your cells can make a specific fragment of the virus, such as a single protein, from the **mRNA vaccine**. Your immune system sees that fragment and learns to nab viruses carrying that same specific fragment.

Examples of **mRNA vaccines** include:
- Pfizer COVID vaccine
- Moderna COVID vaccine



This is Martha, a nice young woman who works at the bank. She's **not** a criminal and poses **no threat**.

Capone left his hat at the scene of the crime, and Martha put it on to **show** the detectives what Capone looks like.

Detectives can **identify** Capone from seeing Martha wearing his hat. They don't need to meet Capone in person to know what he looks like.

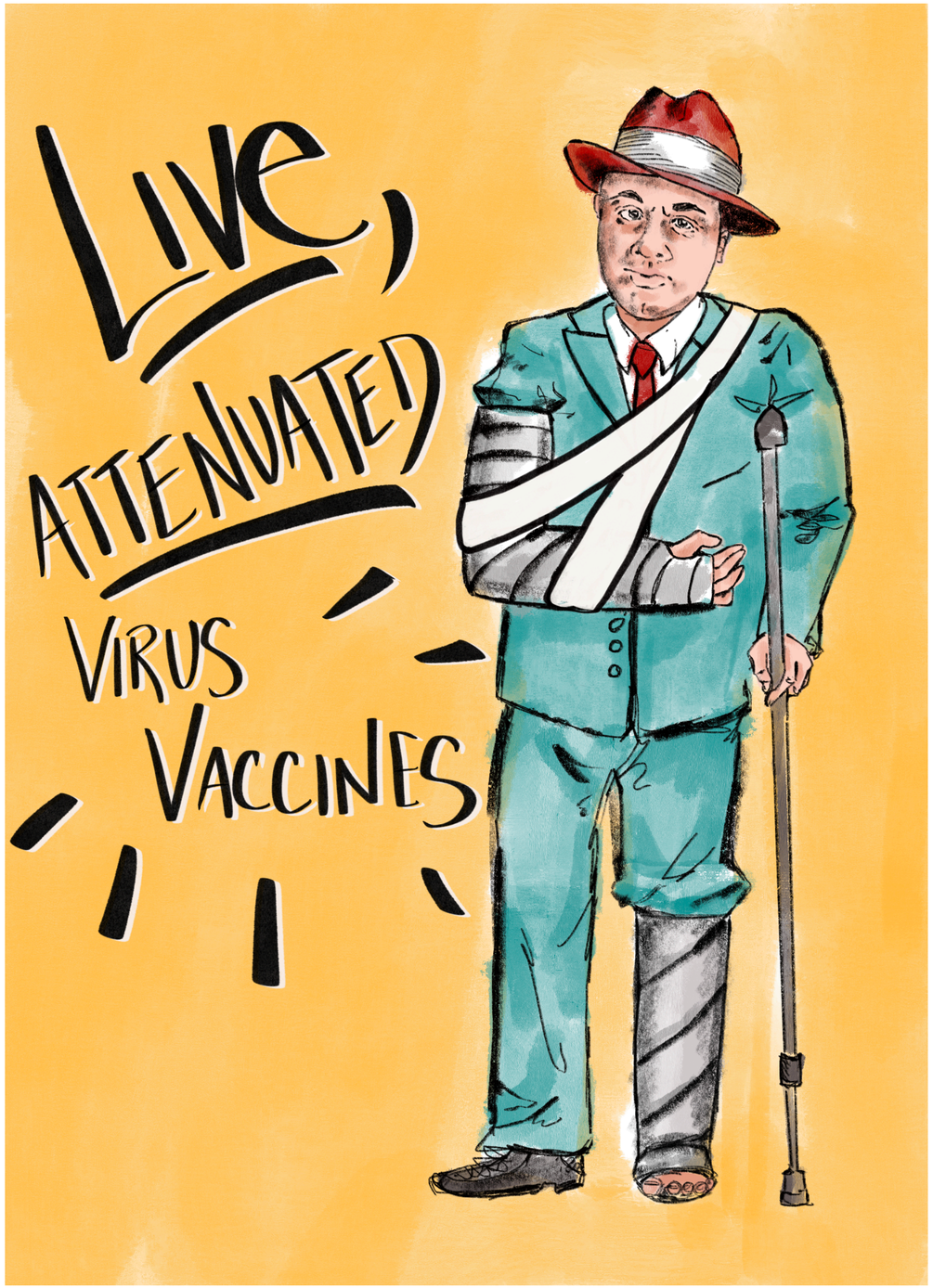
This is how **virus vector vaccines work**. A harmless, non-replicating virus shows the immune system a specific fragment of the virus, such as a single protein. Your immune system sees that fragment and learns to protect against viruses carrying that same specific fragment.

Examples of **virus vector vaccines** include:

*Johnson & Johnson COVID vaccine
*Oxford-AstraZeneca COVID vaccine

Right now, **mRNA** vaccines, **Virus Vector** vaccines, and likely soon, **Subunit** vaccines, are being **used for COVID vaccines** in the U.S.

Here are **two other** vaccine technologies. We're not using these for COVID vaccines in the U.S., but we do use them to teach your immune system how to **fight other viruses and bacteria.**



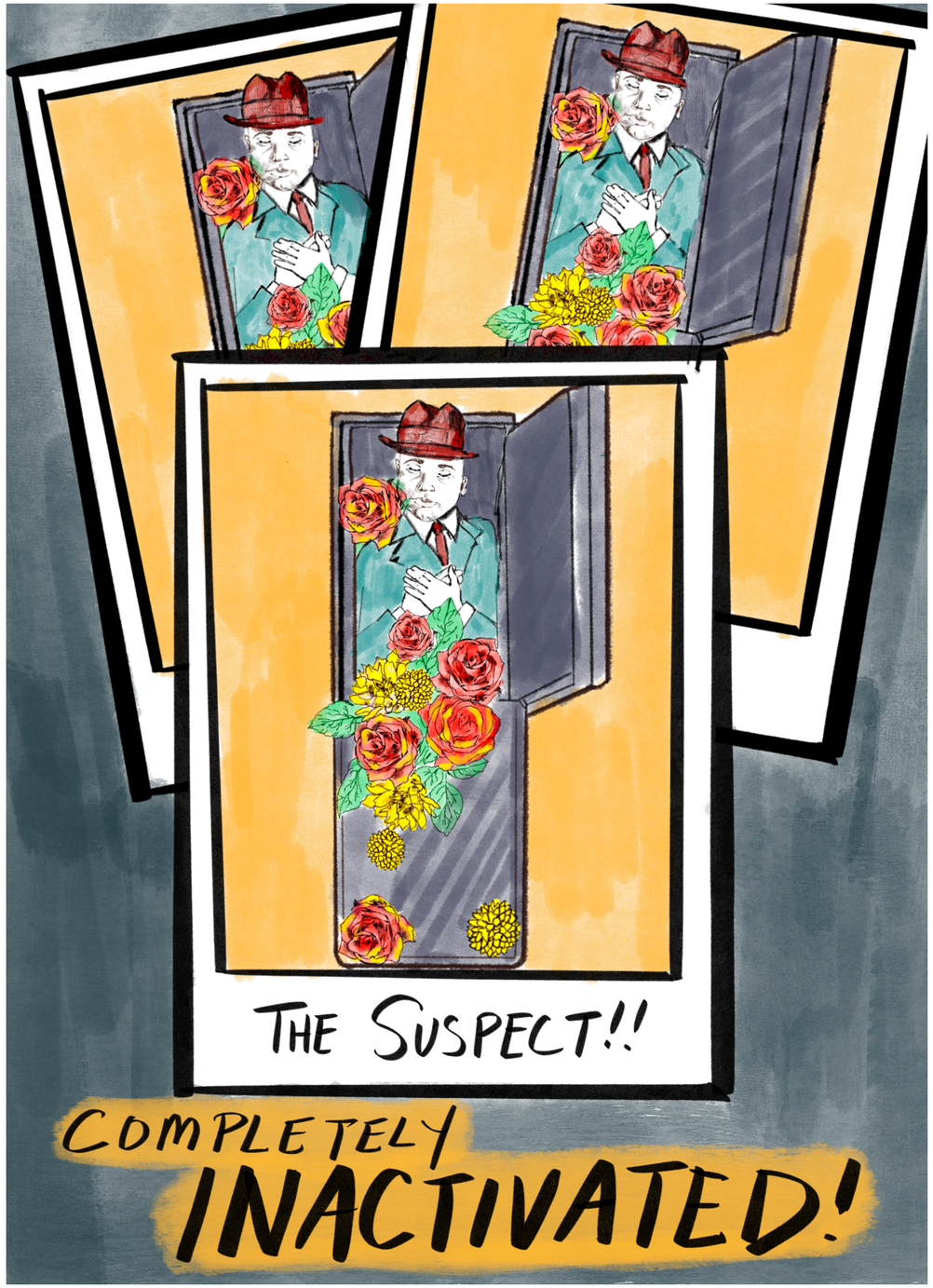
Al Capone got pretty **beat up** in a fight with another mob family. His arms and legs are broken. **He can't fight or hurt anyone.**

But he's still recognizable, and detectives can still arrest him.

This is how **live, attenuated vaccines** work. They're too weak to hurt you, but your immune system sees the weakened virus and learns to recognize more like it.

Examples of **live, attenuated vaccines** include:

- Measles/Mumps/Rubella (MMR) vaccine
- Chickenpox vaccine
- Smallpox vaccine



Imagine if Al Capone had a twin who died in a shootout.

Detectives can still identify Al Capone from his deceased twin.

This is how **inactivated vaccines** work. They're made of dead viruses, which are no longer a threat. The immune system sees the dead virus and learns to eliminate more like it.

Examples of **inactivated vaccines** include:

- Most flu vaccines
- Hepatitis A vaccine

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