Subject: [EXTERNAL] Fall bivalent boosters: Science update round 3
Date: Thursday, December 8, 2022 at 5:46:22 AM Alaska Standard Time
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Fall bivalent boosters: Science update round 3

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DEC 8

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Alright people, the data you've been waiting for: the first real-world effectiveness data on the fall COVID-19 (bivalent) booster. Here are the results.

Science until now

As a reminder, we hoped the fall booster would accomplish three things:

1. **Greater protection** against infection and transmission, by boosting our first line of defense—neutralizing antibodies;
2. **Longer protection** against infection and severe disease, even just by a few months; and
3. **Broader protection,** or the ability to create antibodies that "see" more virus parts and "attach" more strongly compared to the antibodies we have right

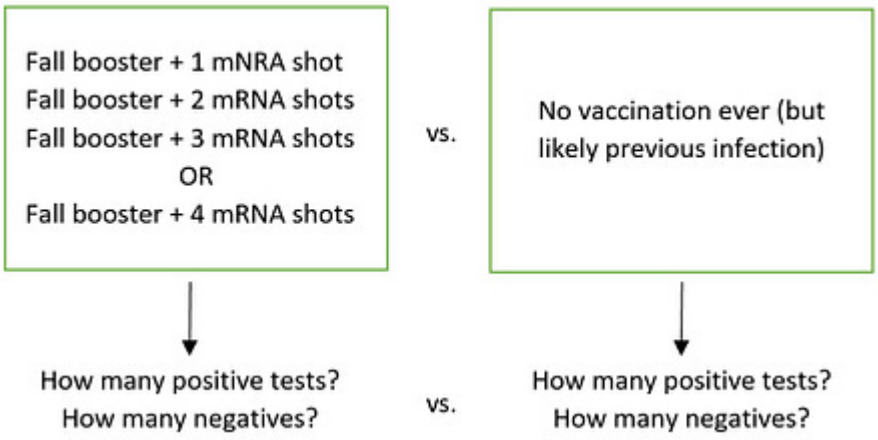
now.

We have ~9 lab studies showing all three of these things are being accomplished (see my previous updates here and here.)

However, what happens in a lab doesn't necessarily translate to the real world. This is because the lab is a controlled setting, and the real world interacts with genetics, environment, complex immunity, human behavior, etc. We always need to rely on both for the "true" picture.

Real-world data

Last Friday, the CDC published the first "real-world" data on effectiveness of bivalent boosters. Their main question: *Does the fall booster (with the bivalent Omicron formula) provide additional protection against **infection**?* They compared people who got the fall vaccine (bivalent vaccine) + 1 mRNA vaccine dose of the regular formula, 2 doses, 3 doses, or 4 doses to unvaccinated people.



Study depiction made by YLE

The scientists used pharmacy data—360,626 tests from September to November 2022—to compare how many people had a positive or negative test.

This is what they found:

- The fall Omicron booster provided additional protection with previous vaccination compared to no vaccination:
    - Among 18-49 year olds, the fall booster was 42% effective against

infection

    - 50-64 year olds: 28% effective against infection
    - 65+ year olds: 22% effective against infection
- There was a similar additional benefit of the bivalent vaccine regardless of the number of previous doses received.
- The more time between doses, the more protection.
    - Among those ages 65 and older, for example, effectiveness was 43% if they got their last mRNA dose more than 8 months ago, compared to 28% if they got their last dose 2 months ago.

In all, this study found that fall boosters are helpful against *infection.*

Real world studies are inherently flawed, especially in places like the U.S. where we don't have a national health system (nor solid data infrastructure). It's messy and imperfect but our reality. This study used pharmacy testing data. People who go to a pharmacy to get tested could certainly be different from those that don't go to pharmacy to get tested (and use at home antigen tests or don't test at all). But this is the best we have right now.

A few thoughts

- ***These results make sense.*** Several lab studies have shown an increase in neutralizing antibodies after the fall booster. Of our immune tools, neutralizing antibodies act the fastest and stop the virus before it starts replicating in our cells. We had a hunch the vaccines would protect against infection. How long this protection lasts against infection is a key question; we are at the mercy of time.
- ***Delay in boosting.*** More time between doses helps prime the immune system. We've seen this with other vaccines. In fact, this is why the U.K. officially recommends at least 12 weeks between doses since the beginning of the pandemic. If we get a booster earlier, we won't "exhaust" or "overwhelm" our immune system, but by delaying we get the biggest bang for our buck. I still stick to my recommendations last month.
- ***Some may be disappointed in these numbers.*** Vaccines are not 100% effective against infection. But protection against infection is an added benefit. I'm

anxious to see data on the effectiveness against severe disease, which is the primary purpose of vaccines. We don't have this data yet. It's coming.

- ***Vaccination (and previous infection) is not enough.*** If you do not want to get sick (miss work, possibility of long COVID, etc.), other measures, like masks, are necessary. Yes, still.

Bottom line

We have lab data for fall boosters. We have real world data. And what's coming in looks good—not perfect, but good. We have lots of reason to believe they will work even better against severe disease, especially among those over 50 years old. Go get your fall booster. We are at the beginning of a wave.

Love, YLE

"Your Local Epidemiologist (YLE)" is written by Dr. Katelyn Jetelina, MPH PhD—an epidemiologist, data scientist, wife, and mom of two little girls. During the day she works at a nonpartisan health policy think tank and is a senior scientific consultant to a number of organizations, including the CDC. At night she writes this newsletter. Her main goal is to "translate" the ever-evolving public health science so that people will be well equipped to make evidence-based decisions. This newsletter is free thanks to the generous support of fellow YLE community members. To support this effort, subscribe below:

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