

From the Lab to Real-World Impacts: NIEHS Tools for Translational Research – podcast transcript

**Narrator:** Have you ever wondered how research done in a lab can have a meaningful impact in the real world? Sometimes it can be difficult to connect the dots, but a workgroup at NIEHS has developed a new Translational Research Framework to help scientists do just that!

Joining us to explain more about translational research and the framework is Kristi Pettibone, Ph.D., a Health Scientist Administrator at the Program Analysis Branch at the NIEHS Division of Extramural Research and Training.

Before we learn about this exciting new tool, let's first look at what we mean by "translational research." Dr. Pettibone explains translational research like this:

**Pettibone** Translational research is the idea that a research project evolves over time and eventually is translated into something that can actually have an impact on human health.

**Narrator:** She went on to explain that translational research refers to the process of moving from basic, also called fundamental, laboratory research that aims to improve scientific theories or understand or predict natural phenomena, to improvements in human health in the real world. She says that NIEHS encourages translational environmental health research with the goal of developing concrete strategies that protect and improve human health.

**Pettibone:** NIEHS is interested in translational research because the bulk of our investments are in basic biomedical research. And, so, what we want to ensure is that the work that we fund in that basic biomedical research area is actually used to inform and to improve human health, to really make difference in people's lives.

**Narrator:** According to Dr. Pettibone, the idea of translational research began with turning basic biomedical research into medical treatments. But standard models of translational medical research are not well suited to NIEHS. The medical model depicts the process of translating research discoveries from the laboratory to patient treatments, often called from bench to bedside. However, NIEHS focuses on interventions and approaches to prevent people from being exposed to harmful contaminants and to protect their health so they do not become ill in the first place.

For example, she described how researchers with the NIEHS/EPA Children's Environmental Health and Disease Prevention Research Centers were working to understand how farm workers may inadvertently bring pesticides from the fields into their homes on their clothing and skin, and how their children may be exposed.

**Pettibone:** And what our researchers found was high levels of pesticides in those homes and in the children's bodies, so this translational research story starts with an epidemiological observation of high pesticide exposure in these farm worker families. The researchers then start to develop all kinds of new methods for testing pesticide exposures in the kids and in their homes.

Those new tools are then used to do some additional interventions and to work with the farm workers to come up with strategies to reduce their exposures and thereby reducing the pesticides that they are bringing home to their kids.

**Narrator:** To help NIEHS grantees and other environmental health scientists understand how their research can be translated, Dr. Pettibone led an NIEHS workgroup to develop the Translational Research Framework. This framework acts as a model and tool to help researchers design and evaluate environmental health research programs and offers a unique solution for considering translation in the overall context of environmental health.

According to Pettibone, the first step was to expand traditional medical frameworks to better represent outcomes in environmental health research.

**Pettibone:** We had to find a way to make the model focus more on non-clinical outcomes, like policy, public health interventions, economic analyses, and things like that.

So, the framework itself is a visual description of the routes that the grantees might take, but it also provided us with an opportunity to define what the typical or usual activities are that our grantees do within the five different areas of what is considered translational research.

**Narrator:** These five areas are, one, Fundamental Questions of basic research or epidemiological observations. Two, Application and Synthesis -- where ideas get tested and applied in very controlled settings, like in a laboratory or small community groups. Three, Implementation and Adjustment -- when researchers take the idea they've tested in a controlled setting and try it out in real-world settings, and then adjust accordingly. Four, Practice -- where we see ideas that have been through the earlier phases and determined to work well enough that they are incorporated into common practice. They can be new tools, or technologies, or policies for prevention practices at the community, state, or federal levels. The fifth area is Impact -- when we assess to see if the tools, technologies, policies, or practices are having the intended impact, or whether we need to make further adjustments. Each phase of translational research involves testing to determine what works and what is not working.

**Pettibone:** I think the easiest thing to do is to think about a solar system model with a series of nested rings.

And then along each of the rings are nodes or mile markers, different types of work that are done within those categories of translational research. So, you can think of the framework as a series of five rings, with multiple nodes along each of those rings.

**Narrator:** The framework shows how a research idea moves from one node to another or from one ring to another -- from fundamental questions all the way out to an impact, like informing policy, for example. Movement from one node to another or from one ring to another is called a translational research *bridge*.

While the framework may sound and appear complex, it is actually quite easy to use. In fact, Pettibone's workgroup developed several tools to help researchers use the framework. She notes that one of the unique ways the Framework can be used is to tell a story about how research has evolved from basic research to having impacts in the real world.

**Pettibone:** We have a translational research story template that grantees can use, that you can kind of think as almost an interview guide. So, if you were trying to write your own translational research story, it just sort of lays out the types of questions that you might want to think about and the kinds of

information that you might want to put into your story. Grantees have found that helpful to use as a way to start to get their thoughts down on paper and to start to get the story mapped out.

**Narrator:** A color diagram of the framework is available on the NIEHS website, at [www.niehs.nih.gov/translation](http://www.niehs.nih.gov/translation), along with links to articles that have been written about it, and case studies describing how researchers have used it. You can also contact Dr. Pettibone if you'd like advice from a translational research coach.

Thanks to today's guest, Kristi Pettibone, for joining us.

You can find links to the translational research tools mentioned in this podcast and learn more about translational research on our website at [niehs.nih.gov/podcasts](http://niehs.nih.gov/podcasts).

Like what you are hearing or have suggestions to help us improve the podcast? Please take a few minutes to provide feedback by going to [research.net/r/peph\\_podcasts](https://research.net/r/peph_podcasts).

You've been listening to Environmental Health Chat. Our podcast is brought to you by the Division of Extramural Research and Training at NIEHS, part of the National Institutes of Health, an agency of the U.S. Department of Health and Human Services.