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Not My Fault: The importance of the last mile

Lori Dengler/For the Times-Standard
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COVID vaccine, building codes, and tsunami alerts. What do they have in common? Expense, science and technology, and the potential to save many lives. And all are of no use unless they reach the user and are implemented effectively.

In disaster management, we call this the last mile. It's shots going into the arms of at least 6 billion people worldwide. It's building stronger structures and strict code enforcement so that you can be assured that your home, office, and the bridges you drive over will stand up to the next strong earthquake. It's everyone on the beach or low-lying coastal areas, understanding and responding to tsunami warnings whether natural or official.

When asked the question – is it harder to develop an effective vaccine or deliver it into the arms of people, my guess is that most of you would say develop the vaccine. I visited the Wikipedia COVID vaccine page but quickly zoned out on terminology. The CDC web site is easier to read (https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/mrna.html) and I now have a little idea of how the mRNA (messenger RNA) vaccines work, but this is cutting edge stuff, complex, and way out of my league.

But most of us have a pretty good picture of how you vaccinate people. You manufacture the vaccine, distribute it to the regions where it is needed and line people up and stick in the needles – right? If you are of my age, you may have even participated in such an effort. I was in third grade in 1955 when we were given the Salk polio vaccine. Seemed pretty easy from my eight-year old perspective.

Not so easy in hindsight. In my four plus decades in working on earthquake and tsunami resilience, I've become very familiar with what we call the last mile and how tragedy results when you ignore it.

Earthquake engineering is closer to my field. I'm no expert but I've been a member of the Earthquake Engineering Research Institute for more than 25 years and back in January 2010, spent a few days working with Bret Lizundia and David Bonowitz on their post Eureka earthquake structural engineering study. They are among the best in the business and opened my eyes in identifying the weaknesses that can result in collapse and major damage.

It's taken more than a century of observations, analysis, modeling and experimental testing to gain an understanding how structures respond to strong ground shaking. The first building codes to specifically mention earthquakes were adopted in California after the 1933 Long Beach earthquake and since then, nearly every major earthquake in the US has resulted in modification and updating codes. It has been a slow piecemeal process with different states and and/or counties and cities, following different regulations.

Like most countries in the world, the US now follows the International Building Code that includes regulations based on the likely stresses in a region such as high winds or ground shaking. But just because we now have a nation-wide set of guiding principles, doesn't mean the structure you live or work in meets those codes. Code enforcement varies widely and, in most cases, is not retroactive.

In earthquake engineering, the last mile is building and planning departments, local decision makers and you and I. It costs more money to build structures resilient to strong side-to side forces whether they come from wind, water or earthquakes. The Pacific Garden Mall was remodeled in the 1980s to attract visitors to downtown Santa Cruz. City planners were aware that many of the structures were brick and unreinforced but opted not to spend funds to retrofit them. It was a fine decision until October 17, 1989 when several building collapsed and three people were killed. I am hoping the City of Portland does not have a similar reckoning as a result of their decision shut down an online database of unreinforced buildings and to stop labeling them as hazardous so that people are forewarned about using them.

At first glance protecting people from tsunamis might seem an easier problem. Send out an alert, activate EAS and expect people to respond correctly. If this is what you think, you probably haven't read too many of my columns. It is more complicated. The official warning system is aimed towards the tsunamis that come from far away. There is plenty of science and technology involved – detecting potential sources, measure water heights as the tsunami travels, understanding how a tsunami interacts with the sea floor and coastal shape and what

areas are likely to be affected. There's technology involved with disseminating the information. But if messages aren't clear and you don't understand what they mean and what to do, it's not of much use.

A potentially more significant tsunami hazard comes from the great earthquake beneath our feet. In this case forget the official warning system. The damage to infrastructure means it is unlikely that any EAS message will get to us before waves start arriving. You need to recognize that the ground shaking will likely be your first and only warning. You may have as little as ten minutes from the beginning of the earthquake to the first waves. We are fortunate to have a pretty good idea of the severity of such a tsunami – visit https://rctwg.humboldt.edu/home to see the latest State map. But you need to be motivated to look at it and know what to do.

When it comes to the last mile, it's useful to start with the family on the beach, the people in a building in earthquake country, or all of us who need immunizations and work backwards. What do we need to know and how can that information get to us? Determine all the steps it will take such as transportation, supply, storage, enforcement and incentives. Identify all the potential places where problems may arise. And make sure you communicate in clear effective ways. The last mile deserves as many resources as everything else because without it, everything else is moot.

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