00:06 Meagan Cantwell: Welcome to the Science Podcast for August 23rd, 2019. I'm Meagan Cantwell. In this week's show, I talk with Greg Miller, about how straightforward solutions can prevent suicides. And Sarah Crespi talks with AR Siders about managed climate retreat, changing where people live in a strategic response to climate change. I'm Meagan Cantwell, and I'm here with Greg Miller, to talk about his story in our special issue this week about promising approaches in suicide prevention. Thanks so much for joining me, Greg.

00:39 Greg Miller: Sure. Glad to be here.

00:41 MC: Your story starts out with some current news, which is that the Federal Communications Commission in the US recently announced plans to change the number of the National Suicide Prevention Lifeline, from 1-800-273-TALK to a shorter three-digit number, likely 988. What kind of effect could shortening the number for this lifeline have on prevention?

01:05 GM: I think the idea is just to make it easier to remember. That 10-digit number is a little cumbersome, and having a simple number like 988 that people can remember will hopefully encourage more people to call and reach out for help when they're experiencing a crisis.

01:21 MC: And there are a number of straightforward approaches as you call them in your story that you talk about, and one of the big ones is lifelines. When did these start? And what is the research shown on their effectiveness?

01:33 GM: Suicide hotlines have been around for quite a while, at least since the 1950s. The current system that we have in the US is called the National Suicide Prevention Lifeline, and it's actually a network of about 170 separate crisis call centers around the country. You get routed to one that's closest to where you are, so that ideally they can connect you to resources in your area, and then if that one happens to be all tied up, you get routed to another close, hopefully a close-by one. Overall, there is more research than I had realized going into this, on the lifeline and the vast majority of people who call report that the experience talking to a trained counselor on the lifeline saved their life and kept them safe.

02:24 MC: So these have been around since the 1950s? Has the technique that these crisis counselors use when they're talking to people on the phone changed much since then?

02:33 GM: It has evolved. There's a research team in Canada that's done a lot of research looking into what aspects of the interaction between the caller and the counselor make for a positive outcome, meaning a reduction in the person's suicidality and intent to harm themselves by the end of the call. These guys listen to thousands of calls in real time. They've got permission from the crisis centers to do this. What they found was actually, really just common sense that when the counselors expressed empathy and established a rapport with the caller, they were much more
effective at reducing their suicidality. They just treat them with respect and take their problems seriously, and kind of work with them to find a solution as opposed to just telling them what to do. That approach seemed to be the most effective.

03:26 MC: And sometimes they also do follow-up calls as well, right? Is this just recently or has this been a practice for a while?

03:33 GM: It's been going on for a while, but the more research is done, the more it suggests that this is a really important thing that the call with a counselor can really help de-escalate a crisis for someone, but it's not gonna resolve a lifetime of problems or serious mental illness or substance abuse. So the idea now is to use that initial call as sort of a foot in the door to getting people into a pathway of care that's tailored to their situation, but the act of following up a few weeks later has been shown to really help people and reduce their feelings of desperation and their intent to harm themselves.

04:12 MC: Another prevention method that you talk about in your story is how care centers, like hospitals and clinics, can refine their protocols in order to reduce the rate of suicides. Could you talk about what that entails?

04:27 GM: The Zero Suicide program is something that's really caught fire in the last five years or so at hospital systems around the country. It did start at Henry Ford, which is based in Detroit, and it came out of a discussion actually that happened after they applied for a grant and didn't get it. The grants were supposed to be for clinicians, trying to design Perfect Care for a particular condition, could be any condition. But at Henry Ford, the condition they wanted to design Perfect Care for was depression and they didn't get the grant and that prompted them to think harder about what would perfect care for people with depression look like. And so one person at the table during the discussions was a nurse and she said, "Well if we had perfect depression care than we would have no suicides," and so that idea caught on and became an aspirational goal for the people there that they should try in every case to prevent suicide.

05:24 GM: And so the program, it's evolved over the years with evidence, but there's some basic things like just screening all of the patients in their behavioral health system. So these are patients who come in with depression or maybe substance abuse, things like that. Screening them at every contact with the hospital to assess their risk for suicide, and then having a pretty standardized pathway of care depending on the risks, so that doctors and providers know, given a patient's risk, like here's the menu of options and a flow chart of the different things that can be done for them to relieve them a little bit of the decision-making process by having it all kind of standardized.

06:07 MC: Other facilities in the United States have also adopted this protocol as well?

06:11 GM: Hundreds, actually of healthcare systems and clinics are trying to implement this now, and there's a large study that's getting underway to see how well it's working at nine big healthcare systems around the country. At Henry Ford it did seem to have a dramatic impact on their suicide rate in the first 10 years or so that it was put in place.
06:35 MC: The last prevention method that you talk about in your story is removing the means to
die by suicide, also notice means reduction. Why did healthcare practitioners think this was an
important thing to tackle?

06:48 GM: One thing is, there's a misconception that when someone intends to take their own life,
that they'll just keep trying and trying, and no matter what they need to do to do that, and that's
really not true. Most people who are in a suicidal crisis, it's brief and their thinking is very restricted
in that brief moment of crisis. They can only see one way out. And if you take that one way, that
means away from them, they're not actually very likely in reality to go find another means to harm
themselves. There's good evidence that this is, in fact, the case. And in the story, I used the example
of Sri Lanka which had in the 1980s, one of the world's highest suicide rates and the most common
means there was ingesting pesticides because a lot of people in Sri Lanka work in the fields
themselves and have access to agricultural chemicals like pesticides, and some of those pesticides
are very, very lethal.

07:45 GM: And so, a lot of the deaths there by suicide were caused by pesticides. And so, once the
national government began to ban some of those over a period about 20 years, the overall suicide
rate in the country began to drop and has now dropped pretty precipitously from what it once was.

08:03 MC: One of the leading means of suicide in the United States is guns though, and that's a
little bit harder to tackle in terms of means reduction, right?

08:11 GM: It's tough to think about banning guns at this point in time in this country. It's just not
gonna happen. So, I talk about a few of the strategies that people are trying to work around the
edges of the problem. A number of states have passed so-called Red Flag laws which allow family
members, police, doctors, the details vary a little bit from state to state, it's a petition to court to
temporarily remove firearms from someone who's at risk of harming themselves or harming others.
So those laws have really come on strong and just the last few years, more and more states seem to
be passing them. At the same time, there's some professional organizations like the American
Medical Association sees this as a major problem, and they're working really hard to encourage
physicians to talk with patients more about firearm safety. It's not a topic that a lot of physicians
feel comfortable discussing, so they're trying to develop some training materials that doctors feel
more comfortable addressing it with their patients.

09:12 Sarah Crespi: Yeah. So within the US, a combination of the multiple approaches to suicide
prevention that you've outlined in your story have been implemented in some way, but despite that,
the rate of suicides in the US has grown since 1999. What do you think might be driving that?

09:30 GM: Yeah. It's really hard to know. I think it's a pretty complex problem. There are a lot of
societal issues, or issues of access to mental healthcare, sometimes economic conditions can weigh
into it. There's no one path that leads someone to the brink of taking their own life, and usually it's
really a combination of factors. And so, I think it's a complex problem, and it's one that probably
needs solutions at different levels from the individual to changes innovations, in healthcare, to
maybe some state or national policy, things that might be able to help. We have some ways to help
prevent suicide. It's just a matter of implementing them and overcoming the barriers whether they
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be cost, or political will, or just people stuck in an old way of doing things.

10:20 MC: Alright. Thank you so much, Greg.

10:21 GM: Thank you.

10:22 MC: Greg Miller is a science journalist based in Portland, Oregon. You can read his story along with others in the special issue at sciencemag.org. Stay tuned for Sarah Crespi's interview with AR Siders about managed climate retreat.

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10:41 SC: This week's episode is brought to you in part by Kroger grocery stores. Did you know that one in eight Americans struggle with hunger? Yet 40% of food produced in the US gets thrown away, and a lot of that food waste happens at home. When food waste is sent the landfill, greenhouse gases are released, so it's a problem for our planet, too. But think about this, if we could redirect just one-third of the food we waste to people in need, we would more than cover the unmet food needs across the country while helping to protect our planet. That's what Kroger is doing, through their Zero Hunger, Zero Waste Foundation. Last year alone, Kroger donated 325 million meals to food banks, and they've got some great tips to help produce food waste at home, too. It's all part of their goal to achieve zero hunger and zero waste by 2025. Check out kroger.com/zhzw to learn more. That's kroger.com/zhzw. This week's episode is also brought to you in part by KiwiCo. KiwiCo creates super cool hands-on projects for kids that make learning about STEAM fun.

11:55 SC: With the KiwiCo subscription, each month the kid in your life will receive a fun, engaging new project which will help develop their creativity and their confidence. The projects are designed to spark tinkering and learning in kids of all ages. All projects inspirations and activities are created by a team of product designers in-house in Mountain View, California, and rigorously tested by kids. Every crate includes all the supplies needed for that month's project, detailed, easy-to-follow instructions, and an educational magazine to learn even more about the crate's theme. KiwiCo inspires kids to see themselves as makers, and is on a mission to empower kids, not just to make a project, but to make a difference. KiwiCo is offering Science Magazine podcast listeners the chance to try them for free. To redeem this offer and learn more about their projects for kids of all ages, visit kiwico.com/magazine. That's kiwico.com/magazine.

[music]

13:00 SC: A lot of thought and planning that we're doing nowadays seems to focus on averting climate change, or at least preventing the worst effects from happening. But some things will happen. Waters are probably gonna rise. We're gonna see more intense storms, more unpredictable weather, changes in the way water moves around the planet. AR Siders and colleagues wrote a policy forum this week in science talking about something called a climate retreat. And this is not about giving up on climate change, but it's more about being strategic about where people live and making sure that any changes to that are well-managed. So, welcome, Siders.
13:39 AR Siders: Hi.

13:39 SC: So, people ask you what you study and do you feel like you're gonna blab them, out right away?

[chuckle]

13:44 AS: So, yeah. I tell people I deal with coastal climate change and hazards and how we think about that. I think initially people can have a strong reaction to that 'cause no one wants to leave their home, the place where they live, but after a minute or two, a lot of people can start to think, yeah, maybe not right now, but you're right. If the hurricanes get terrible, if it starts flooding all the time or 30 years down the road. Maybe not today, but 30 years down the road, we really will need to start thinking about that. So, a big question in managed retreat isn't just it's not gonna happen today, it might not even happen this decade. In some areas, we're talking 20-30-40 years down the road. But we have to start thinking that long because we're building buildings and we're building roads and we're building transportation that lasts for 50 or 100 years.

14:30 SC: So, I gave a really quick definition of climate retreat. How do you define that term?

14:35 AS: We often say managed retreat to mean moving people and assets out of harm's way, away from risks like wildfire or floods or sea level rise. Our two main arguments in this policy forum are that managed retreat needs to be integrated into a bigger strategy and it needs to be managed in a way that meets those strategic goals. You're not just moving people for the sake of moving them. You're doing this because you want them to be safer or you want to create a public park or you want to revitalize your local economy. There's something else, some goal that you're trying to achieve, some bigger broader goal. There are many different ways you can reallocate people. You can ban re-building. You can buy out their homes. You can help a whole community relocate. The way that you do that managed retreat should be chosen in order to help you meet that goal.

15:24 SC: Is there any quantification of the number of people at risk from, say, floods and fires as a consequence of climate change?

15:31 AS: Worldwide, there's several estimates, some say as many as a billion people could be threatened, some say it's several hundred million. The United States alone estimates range from about 13 to 120 million people being at risk from sea level rise and floods.

15:45 SC: Are there retreats already happening? Can you give an example of some place where people no longer build or where people have had to move away because of the change in climate or because of risk of fire or flood?

16:00 AS: There's actually lots of retreat happening all over the world. It just doesn't get much attention. It's not often integrated into big strategies in the United States. We can talk about unmanaged retreat which would be what happens when people just abandon their homes and leave them after disasters. And then there's managed retreat happening. The Federal Emergency
Management Agency, FEMA, has been funding relocation, buying up flood-prone homes and helping homeowners move away from flood planes for the last 30 years and that's happened all over the country.

**16:31 SC:** So, those are US examples. What about around the world? Because climate change is pretty global.

**16:36 AS:** Internationally, we've seen a lot of countries that have done retreat. We see retreat in Australia, Germany, Japan, New Zealand, Philippines, Sri Lanka, Colombia. The Philippines had a number of efforts to relocate people after a series of typhoons hit the country. So, they wanted to move these sort of at-risk settlements that are near the coast and near these flood planes into safer areas farther inland. The Philippines is actually considering relocating their government more inland. Jakarta, Indonesia is considering relocating their main government and infrastructure farther inland to avoid sea level rise and floods.

**17:11 SC:** Where do people end up? Where they retreat to? Those places are not always prepared for the newcomers.

**17:17 AS:** Yes. And they can be completely unprepared for the newcomers. And honestly, we don't know a lot about where those people go and where they do end up and whether they're better off or not. We can't provide support for them, which they might need. They might need psychological support or social support or financial support. And if we don't know when they're leaving, how they're leaving, or where they're going, it's very difficult to support them during that transition.

**17:39 SC:** What are some of the incentives for people to keep living in these areas that are so endangered? Why can't people just say, "Oh, this is not looking good, we should just get out of here."

**17:49 AS:** Yeah. In some places people might have jobs nearby. They might be fishermen. They might work at the port. They might work in the oil industry off-shore. In other places, they might have lived there for generations. They might be living in a home that their great-grandfather built and feel deeply connected to that place. And in other areas they might just really enjoy the view and like living on the coast. There's all these different kinds of logistical, practical and sort of emotional amenities that come from living in these at-risk areas.

**18:18 SC:** Do you wanna also mention some of the incentives for people to sell real estate in these areas?

**18:23 AS:** [chuckle] Yeah. So, property developers have a very short term interest. There can be a huge incentive to build, to put in more infrastructure, more buildings, more people. Local governments get property tax revenue from those developments so they might be encouraging that kind of development because they know that if it stands for a year, well, they're not gonna be there when the hurricane hits two years from now. They're not the ones who are gonna have their basement flooded or they're not the ones who are gonna lose all of their family photos. They have a short-term economic incentive to make money from building these buildings and then the people
who live there have the long-term consequences.

19:00 SC: Do you see this as a message for people who live in at risk areas, for people who are making policy at the government level? Who's the best audience for this information?

19:10 AS: Probably government officials, non-profits who are engaged in this space, community advocates who are trying to think about, how what they want their future to look like. But I also hope that homeowners and community members will take this as a way to think about what they want. What do you want your community to look like in 30 years or 50 years? If you can think of what you want it to look like, getting there to that goal might require some retreat along the way.

19:36 SC: And what about keeping a community together? So, say, your family and all the neighboring families have lived in the same place for a really long time, can you just all move together? Is that something that could be planned and managed?

19:49 AS: There are examples of small communities, couple hundred people, relocating together. So, finding a new site, building new homes, and deciding they're going to move as a group. It can be particularly important for communities that are very tight, that have lot of social cohesion, or internationally, it might be really important for sovereign nations that are trying to move large groups of people.

20:11 SC: Are there examples of people moving from country to country, in a managed way?

20:15 AS: Moving from country to country so far hasn't happened entirely, yet. But we're starting to see examples, especially from low-lying island nations. So the Marshall Islands has an agreement with the United States that Marshall islanders can move to the United States. Kiribas and Fiji are starting to think about where their people are going to go internationally, when sea levels rise.

20:35 SC: Wow. That's... Those... I mean, that's abandoning a whole island.

20:39 AS: The reality for some of these islands is that if climate change isn't stopped very soon, some of these island nations are going to disappear. They're not just facing the loss of their community or their neighborhood, they're facing the loss of their country and potentially their sovereign status as a nation. It's a real challenge.

20:55 SC: How do you pick where to go?

20:57 AS: This is a really difficult question. For the Marshall Island, it was a result of historic connections, where they have opportunity because of the things the United States has done to the Marshall Islands. For Kiribas, why they chose Fiji, I actually don't know. In terms of homeowners who are moving to a new neighborhood, it might be just as simple as this is where government is providing support for me to go, or this is where I can afford to move to. We don't know enough about where people are going to really know why they choose to go where they do.

21:28 SC: This is... Yeah, it's intense.
21:32 AS: It's a real research problem in terms of... Even in terms of, say, like the United States, these relocation programs, we don't know enough about where people go. We don't know. Their homes are purchased and then they move somewhere. And we don't have data on where that is.

21:44 SC: What about this Bangladeshi idea of making cities more attractive? So instead of just preventing people from buying houses, it's instead making them want to go to the city.

21:57 AS: I heard this idea presented by Dr. Salim Mouhuc out of Bangladesh. And the idea was how do we invest in areas where people are moving to, so large urban areas. And how do we invest in places where... Maybe it makes sense for them to go, away from the coast, away from the most vulnerable areas, so that we have something for people to move towards. This proposal in Bangladesh was how could they provide educational opportunities or employment opportunities so that maybe people aren't leaving immediately, but maybe instead of staying on the coast and being fishermen who are tied to the coast and need to live in vulnerable areas, maybe they have more opportunities to live in the city and have a different employment trajectory in a safer space.

22:40 SC: We're talking about leaving land, leaving property, changing jobs, ways of life. And one thing you write about is how this affects different people differently. This isn't always fair.

22:52 AS: One of the things we try to notice is that retreat can be really inequitable. It can be really hard on people who have the fewest resources, on the lowest income, and poorest neighborhoods. In a lot of places in the world, the people who live in the most vulnerable areas are also the people with the fewest resources to deal with that. If we just say people need to retreat on their own, they might not have the resources to move. Moving is expensive. It can be hard. You might have to abandon your property if you've put in an investment in that, or you might have to lose your job. If we can do retreat in a way that provides support for people that is strategic, trying to achieve goals, and managed in a way that helps people, hopefully, we can address some of the inequality that comes with this.

23:39 SC: This just seems really hard. I think I'm just feeling very cynical this month.

[laughter]

23:43 AS: Of the adaptation options, retreat is a really challenging one. All adaptation is challenging in different ways. But retreat can be really challenging because it touches on so many aspects of politics, finances, and incentives and people's emotions and their history, right? It's tied up in all of these difficult problems, and yet, it's so needed that we have to try to untangle those. Some days, I'm more optimistic about it than others, but I always come back to the idea that we need to do this and so I'm gonna force some optimism. I'm gonna be optimistic about it, because we need to do it.

24:19 SC: Maybe it's a branding issue. [laughter]
24:22 AS: Yeah. This is often a discussion, is could we not call it retreat, because retreat sounds like we're losing.


24:31 AS: Yeah. Right. Exactly, like "Oh, we lost." My favorite quote on retreat comes from US Marine Corps General, Oliver Smith, who gave this. He says, "Retreat, hell. We're just advancing in a new direction."

[laughter]

24:45 AS: I loved it, right, 'cause it's so Marine Corps Oorah. But it's also really important. We can't just think about this as we're giving up or retreating. It's really about stepping back, taking stock, and moving in a new direction. And that's why the idea of giving people an incentive or why should they move away? Let's put something attractive inland. It can't just be about where they're leaving. It has to be about why they're moving to something. Give them something to move towards, as well as away from. It's not about losing. It's about choosing which battles to fight. Do we want to try to hold the ocean back in this place? Maybe not, maybe we just don't wanna fight that battle. And so we're gonna move back, pick something else to put our energy into.

25:26 SC: I feel like if we were able to make decisions like that, coordinate a bunch of different processes to make it happen, that would be a real advance.

25:33 AS: Yeah. [chuckle] And coming down to the government, how you do this is always... Always really difficult. I take a lot of encouragement from the fact that people are doing this. There's a long list of countries that have done this. The US has done this. It's not impossible. It's just difficult. And those can seem like the same thing sometimes, but they're very different.


25:56 AS: Thank you for taking the time. Really appreciate this.

25:58 SC: AR Siders is a professor at the Disaster Research Center at the University of Delaware. You can find a link to her story at sciencemag.org/podcasts.

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26:09 MC: And that concludes this edition of the Science Podcast. If you have any comments or suggestions for the show, write to us at sciencepodcast@aaas.org. You can subscribe to the show on iTunes, Spotify, and many other places. Or you can listen on the Science website. There, you'll find links to the research and news discussed in the episode at sciencemag.org/podcasts. To place an ad on the website, contact midroll.com. This show was produced by Sarah Crespi and Meagan Cantwell and edited by Podigy. Jeffrey Cook composed the music. On behalf of Science Magazine and its publisher, AAAS, thanks for joining us.