Overview of Accomplishments 2025-2026

Branching Out, Sharing Knowledge, Changing Practices

Childhood Cancer & the Environment

A project to educate and activate health professionals to address environmental influences on childhood cancer

PEHSU Pediatric Environmental Health Specialty Units

pehsu.net

Dear Colleagues,

We are so grateful to have completed our fourth year of this project with so many outstanding colleagues. We are especially proud of our partnerships with pediatric oncologists at Children's Mercy Kansas City and Texas Children's Hospital. Dr. Nikki Wood and Dr. Omar Shakeel lead these efforts with the goal of improving survivorship outcomes, preventing cancers in those with predisposition syndromes, providing answers to families' questions and guidance on reducing hazardous exposures.

My colleagues at the Center for Integrative Research on Childhood Leukemia and the Environment and I had the pleasure of summarizing the state of the science of environmental impacts on childhood cancer a decade ago in **Childhood Leukemia: A Preventable Disease** (Pediatrics, Nov. 2016). We have come a long way in understanding environmental contributors to childhood cancers and we are proud to still be translating that information into clinical and public health practice today. Our colleagues have been eager to learn and incorporate this into their work.

From a more engaging and expanded website to interviews in *Time* Magazine, we are in an exciting period of growth for the program. As we branch out to share knowledge with others, I am grateful to see clinicians and others recognize the importance of prevention, begin to implement changes in practice, and grow with us.

– Dr. Mark Miller, MD, MPH, *Program Lead*

Every towering redwood tree has a small beginning. Connected by a shallow root system, redwood trees grow in communities. They help support each other to withstand storms and flooding, and share nutrients. Like this network of cooperation, the **Childhood Cancer and the Environment Project (CCEP)** is growing through branching out and via a network of communities and support that began four years ago. This year we have benefited from Perry Sheffield MD, MPH (Region 2 PEHSU co-director) joining the CCEP leadership team.

Our support from Trevor's Law, via the Centers for Disease Control and the Agency for Toxic Substances and Disease Registry (CDC/ATSDR), has enabled us to continue our work in a variety of capacities. Our efforts have led to the growth of knowledge about environmental risk factors for childhood cancer amongst an ever-wider field of people, from health care providers to decision makers to the general public. Please read on to see how we have branched out, shared knowledge, and changed practices during this past year, including through numerous workshops, trainings and webinars.

Workshop presenters and attendees at the University of Southern California Wrigley Marine Science Institute on Catalina Island.

> “In our work on childhood cancer, we have discovered that clinicians want to know that the science supports a sound basis for including environmental risk factors in discussions, and they want clear action items they can implement in practice.”
>
> –Dr. Mark Miller,
> *CCEP Program Lead*

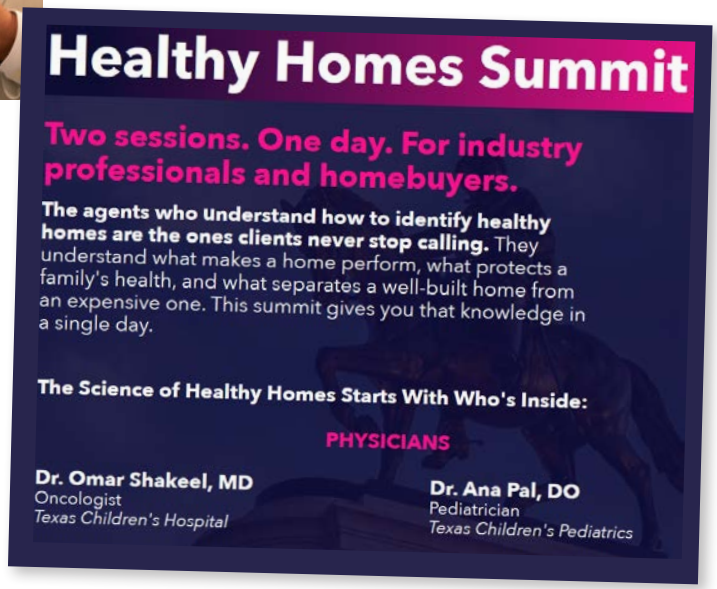
Sharing Knowledge and Changing Practices

Drs. Nicole Wood, DO and Omar Shakeel, MD at Catalina Island training

Our CCEP affiliated pediatric oncologists, Drs. Omar Shakeel (Texas Children's Hospital) and Dr. Nicole Wood, DO, (Mercy Children's Hospital Kansas City), have been integrating environmental risk factors into pediatric cancer care, answering patients' need for reliable information on how to reduce exposures to improve the health of cancer patients and survivors. They provide examples of where a consult service may be based including in predisposition and survivorship clinics. Having a trustworthy resource within the clinical team may reduce the anxiety that many families experience during their cancer journeys.

They have provided this clinical context in presentations at our workshops, webinars, and publications sparking interest from many clinicians.

Drs. Wood and Shakeel have become sought after speakers for programs that want to address the environment and child health. Dr. Shakeel spoke about "the home is a health intervention" for a day-long healthy homes summit in Houston for real estate professionals and parents that was enthusiastically received.



We conducted in person workshops at Emory University in Atlanta and at the University of Southern California Wrigley Marine Science Institute on Catalina Island. Attendees came from at least **6 children's hospitals, 7 universities, two cancer registries, as well as federal agencies**.

Each workshop covered a broad curriculum of the scientific basis for environmental impacts on childhood cancer incidence and outcomes including the epidemiologic studies on air pollution, radiation, solvents, and pesticides.

The days also included practical review of exposure reduction techniques accessible to all. Drs. Wood and Shakeel presented sessions on integrating environmental health into pediatric oncology clinical work and provided insights from their experiences in survivorship and predisposition clinics. Participants included pediatric oncology physicians, fellows, and nurses as well as Ob/Gyn and maternal fetal medicine specialists, epidemiologists, federal and state employees, and others.

Visit our **blog** to read more about the Catalina Island workshops.

Survey from 3 Major Childhood Cancer Centers

Providers frequently get questions about the role of environmental exposures and requests for advice.

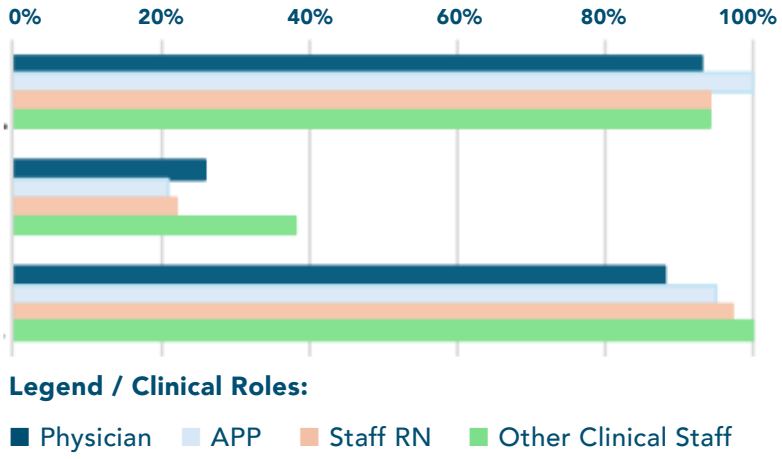
"Yes" Responses by Clinical Role

Questions Asked:

Are you aware that environmental exposures can increase the risk of childhood cancers?

Are you comfortable discussing environmental risk factors in relationship to cancer risk?

Would a referral service be helpful in addressing these issues with families?



Over **90%** of pediatric oncology clinicians at these three institutions support the development of an environmental health consult service and would refer patients to it.

Sharing Knowledge and Changing Practices

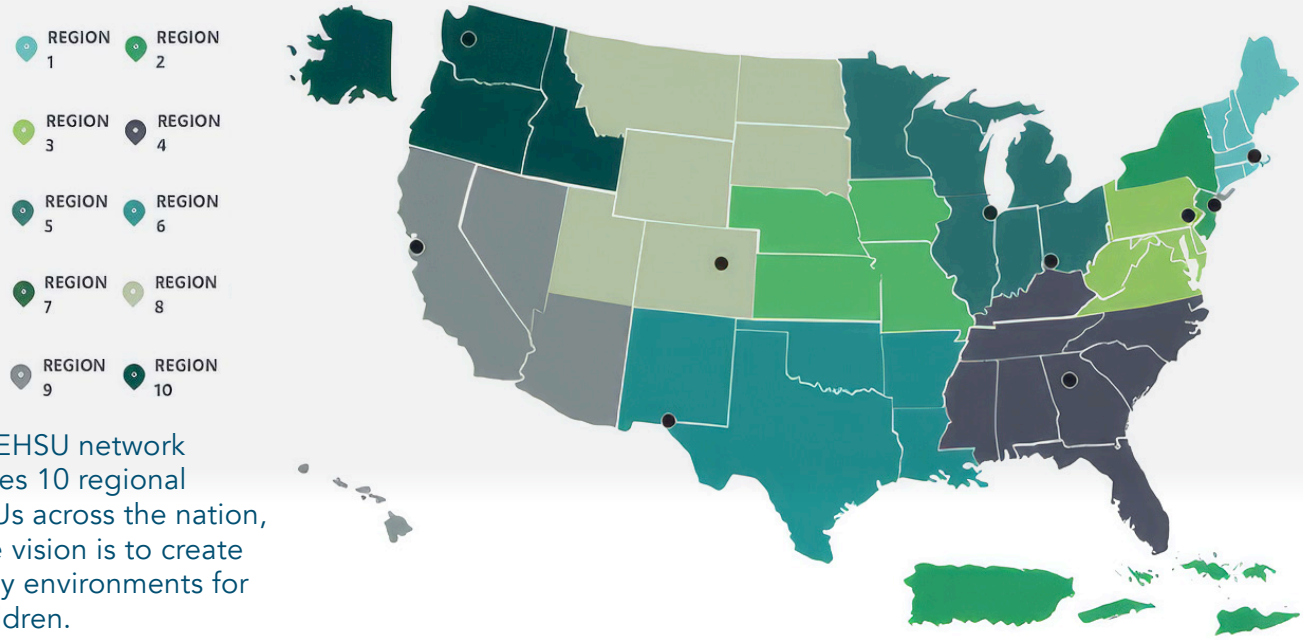
With the leadership of our pediatric oncologists, CCEP is demonstrating the feasibility of including environmental health consultation within clinical practice environments. The goals of a pediatric environmental health consult service are:

1. Advance understanding of environmental risk factors for childhood cancer both to inform primary prevention efforts that may reduce incidence and to support survivors by minimizing exposure-related morbidity and mortality.
2. Reduce family anxiety by directly addressing questions about potential environmental causes of their child's cancer.
3. Provide current, evidence-based information on environmental risk factors for childhood cancer.
4. Offer families practical, low-cost strategies to reduce harmful exposures in the home and community.
5. Support primary oncology teams by equipping them with the knowledge and tools to engage in these discussions as part of routine care.

> “Our research group and many others around the world have now consistently identified several risk factors for many childhood cancers, such as air pollution, pesticides, organic compounds, and poor diet, as well as genetic susceptibility.”
>
> –Dr. Catherine Metayer, MD, PhD
> *University of California Berkeley*

> “Given that some preventive efforts will necessitate addressing prenatal exposures, it makes sense for OBs to be educated about childhood cancer and potential avenues for prevention.”
>
> –Dr. Marya Zlatnik, MD, MMS
> *Maternal Fetal Medicine Specialist, University of California, San Francisco*

> “While epidemiologic evidence on environmental influences continues to accumulate, questions from patients and families about potential environmental causes of cancer remain deeply personal and pressing.”
>
> –Dr. Nikki Wood, DO, *Associate Professor, Board-Certified Pediatric Hematologist/Oncologist & Clinical Informaticist, Mercy Children’s Hospital, Kansas City*



The PEHSU network includes 10 regional PEHSUs across the nation, whose vision is to create healthy environments for all children.

Branching Out

Surveys have indicated that pediatric oncology faculty have had limited exposure to recent studies about environmental influences on childhood cancer incidence or outcomes but are interested in learning more. The CCEP has added "Why are childhood cancers rare when environmental exposures are so prevalent? Gene x Environment Interaction" and "Radiation Exposures and Childhood Cancers" to our "science videos" collection. This brings the total of these teaching videos for clinicians to **10 with hundreds of views annually**. Regional PEHSUs educated professionals throughout the country about childhood cancer and the environment across regions in the following ways:

Dr. Alan Woolf and Dr. Marissa Hauptman of PEHSU Region 1

Region 1 PEHSU: In **Boston**, Dr. Marissa Hauptman and Dr. Alan Woolf presented an hour-long plenary session to **150 health professionals** entitled: "Unveiling the Hidden Threat: Environmental Causes of Pediatric Cancer" at the American College of Medical Toxicology Annual Meeting in March 2026.

Dr. Hannah Thompson of PEHSU Region 2 (shown at right) with Dr. Chelsea DeBolt at the Cancer and Environment CME event

Region 2 PEHSU: In **New York**, Dr. Hannah Thompson spoke to health professionals on "What we know about environmental exposures and obstetrics and gynecology and pediatrics" at the Cancer and Environment CME event in November 2025, hosted by Columbia University and Silent Spring Institute. View the recording **here** *(begins 00:32:00, goes to 01:20:00)*.

Region 3 PEHSU: In **Pennsylvania**, the PEHSU hosted a webinar with **67 attendees** on childhood cancer prevention and the environment, with Dr. Mark Miller and Dr. Nikki Wood.

Region 4 PEHSU: In **Georgia**, the PEHSU hosted an in-person training for **46 health professionals** at Children's Healthcare of Atlanta. Dr. Jinbing Bai, the regional CCEP champion is working with the pediatric oncology division to develop a consultative service.

Region 6 PEHSU: In **Texas**, the PEHSU helped organize the Dallas Children's Environmental Health Symposium in February 2026 for **over 100 health professionals**. The event included a session on Environmental Exposures and Childhood Cancer.

> "We are particularly focused on educating health care professionals around what we know about environmental exposures and childhood cancer...it's something that we don't learn much about in medical school, but it's really important."
>
> –Dr. Hannah Thompson, *Childhood Cancer & the Environment Champion, Region 2 PEHSU*

> "Prevention and education today can make a real difference in a child's life years into the future."
>
> –Dr. MaryKate Cardon,
> *Co-Director, Region 10 PEHSU*

Branching Out, continued

Region 7: In **Kansas**, Dr. Nicole Wood met with **20 Genetic Counselors** at Children's Mercy Hospital, Kansas City. The session combined an overview of CCEP research translation efforts and prompted an engaging discussion on practical risk reduction strategies for children with inherited cancer predisposition, receiving highly positive feedback from participants.

Region 10: In **Washington**, the CCEP team led by MaryKate Cardon DNP, CPNP-PC published an article in Washington state's chapter of the National Association of Pediatric Nurse Practitioners (NAPNAP). The article included information about childhood cancer and was shared with **160 Pediatric Nurse Practitioners**. The PEHSU also presented childhood cancer information to the Advanced Nursing Education Workforce program at University of Washington Doctor of Nursing Practice Program. This group specializes in rural or hard-to-reach communities.

Spreading Roots: Community Health Workers

Community outreach via Promotores de Salud and other community health workers (CHWs) is critical to delivering vital information directly to families. Our PEHSU champions in Texas and Washington state have been busy this year conducting trainings using our innovative flipbook materials for these essential health professionals, both in-person and virtually. Collaborations with family foundations and advocates has enlarged both our perspectives and reach.

CCEP engaged Community Health Workers (CHWs) in the last year as follows:

Texas:

The **Region 6 PEHSU** has continued regular coordination with EPA Region 6, ATSDR, the Border Office, and other regional partners to address educational priorities, training locations, and border-region needs. These partnerships and relationships are already helping us build our training calendar for the next fiscal year. The Region 6 CCEP program has trained **78 CHWs** this year. Erica Guerrero PA gave presentations about working with CHWs to educate communities about childhood cancer and the environment at CCEP workshops in Atlanta and Catalina Island, CA.

Washington:

Region 10 PEHSU presented on CCEP in March 2026 to **20 attendees** (CHWs and public health workers) from the Washington Department of Health. This group develops modules and hosts online trainings for Washington CHWs pursuing continuing education. In May 2026 in Vancouver, Washington, region members presented at a community baby shower hosted by the Southwest Washington Accountable Communities of Health (SWACH).

Idaho:

Region 10 PEHSU held an in-person training for **30 CHWs** at the Idaho CHW Association (ICHWA) annual conference in Boise, Idaho, in April 2026.

Erica Guerrero, MS, MPAS, PA-C,
Region 6 PEHSU

> *"I feel very equipped to tell others about childhood cancer and so much more knowledgeable on the risk factors."*
>
> – Community Health Workers training attendee

Spreading Roots: Families

Jonathan Agin JD
Prep4Gold

Judy Rees
California Cancer Registry

California:

Jonathan Agin JD (Prep4Gold foundation) spoke with health professionals at the CCEP workshops at Catalina Island, California, and Emory University. He shared his perspective as a parent whose daughter passed away from cancer, and his continued work on advocating for children with cancer by organizing the first Childhood Cancer Prevention Symposiums and establishing a consortium of foundations to focus on childhood cancer prevention (Childhood Cancer Prevention Consortium).

KoaStrong Foundation founder, Lisa Pagán shared her story **in a CCEP blog** about losing her son to leukemia and using CCEP materials in her outreach to local schools and health fairs to advocate for childhood cancer prevention.

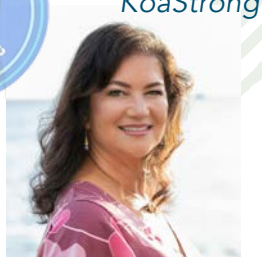
Judy Rees, director of the California Cancer Registry, spoke at our Catalina training, strengthening our ties with this important organization.

> *"I like that the impact of the father's preconception health and post-birth behaviors was also incorporated into the presentation. They also play a role in impacting the child's health."*
>
> – Community Health Workers training attendee

Dr. Catherine Metayer, MD, PhD
Pediatric Environmental Health Specialty Units (PEHSU)

Hannah Wilkerson
Children's Environmental Health Network

Lisa Pagán
KoaStrong



National Organizations:

CCEP significantly expanded **our website** on pehsu.net with the help of PHI's Whitney Sterten-Hall, which includes a **dedicated page** on information for families.

CCEP continues to collaborate with the Children's Environmental Health Network (CEHN), the premier national NGO with a focus on children's environmental health, including childhood cancer. They work with us on reaching a broader audience concerned with these issues. CEHN's Hannah Wilkerson leads us in publishing our every other month **newsletter**.

CCEP has continued to work with the Trevor's Trek Foundation (Trevor Schaefer and Charlie Smith) who have supported communities impacted by unusual patterns of cancer.

Catherine Metayer presented an invited webinar for the Council of State and Territorial Epidemiologists. We look forward to strengthened ties with these important state level scientists who are the front line in addressing unusual patterns of childhood cancer occurrence.

> *"I am deeply grateful for the CCEP creating space to discuss childhood cancer prevention and early detection in a manner that is both evidence-based and empowering for families. Too often, these conversations are absent from the public dialogue, and PEHSU continues to lead by providing trusted information while encouraging curiosity, collaboration, and hope."*
>
> –Lisa Pagán,
> *Founder & Executive Director of KoaStrong.*

Reaching New Heights (Media & Outreach)

GROWTH IN MEDIA AND PUBLICATIONS:

Publications:

- **Volume 55, Issue 9 of Current Problems in Pediatric & Adolescent Health Care**

  Childhood Cancer and the Environment: Activating Clinicians for Prevention

  Guest editor, Dr. Mark Miller.

  In this unique, full clinical journal edition devoted to childhood cancer and the environment, we present a portion of the substantial developments in this field during the last decade. Each paper includes a perspective on how this research relates to current and future clinical practice. All of these papers are open access and can be found **here**. We also have a blog about it in **English** and **Spanish**. Articles include:

> *"Families can take better care of their child with cancer when the pediatric oncology team helps them prepare for bad weather and poor air quality."*
>
> *–Perry Sheffield MD, MPH*

Integrating environmental risk factors into pediatric cancer care: Laying the groundwork for improved outcomes and primary prevention.

Nicole Wood, Omar Shakeel, Juan Ortega-Garcia, Mark Miller

From their experiences integrating consult services into pediatric oncology care in two programs in the U.S. and one in Spain, the authors provide examples of where a consult service may be based including in predisposition and survivorship clinics.

Read the article here.

Integrating extreme weather and air pollution risk reduction into pediatric cancer care

Hannah Thompson, Omar Shakeel, Mark Miller, Perry Sheffield

Extreme weather can result in treatment and communication disruptions, health system closures, and severe stress for both patients and providers. Thompson and colleagues provide practical guidance on preparing for the extreme weather events that are occurring frequently.

Read the article here.

Impact of the environment on childhood cancer clinical outcomes

Dr. Catherine Metayer

This review provides the foundation to consider integrating environmental health into the treatment plan for childhood cancer patients and survivors, alongside other known therapeutic and modifiable prognostic factors.

Read the article here.

Impact of the environment on childhood cancer clinical outcomes

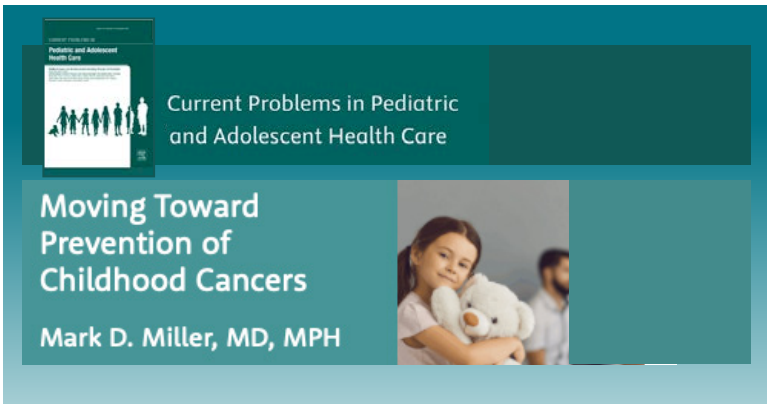
Catherine Metayer, MD, PhD

Impact of infection and microbial exposures on pediatric cancer

Kensie Soule BS, Nina Nelson BS, Joseph Wiemels PhD, Rachel Gallant MD MS

Integrating extreme weather and air pollution risk reduction into pediatric cancer care

Hannah M. Thompson MD, MPH, Omar Shakeel MD, Mark Miller MD MPH, Perry Sheffield MD MPH



The relationship of dietary folate, folic acid, and childhood cancer

Yijin Xiang, Joseph L. Wiemels, Eric M. Nickels

Investigating the causes of childhood acute lymphoblastic leukemia through mutational epidemiology

Adam J. de Smith, Naying Zhou, Yunqi Li, Tanxin Liu, Nathan Patrus, Joseph L. Wiemels

Integrating environmental risk factors into pediatric cancer care: Laying the groundwork for improved outcomes and primary prevention

Nicole M. Wood, Omar Shakeel, Juan A. Ortega-Garcia, Mark D. Miller

The relationship of dietary folate, folic acid, and childhood cancer

Yijin Xiang, Joseph L. Wiemels, Eric M. Nickels

The authors suggest, "educating and identifying women who are at risk of pregnancy, emphasizing that folate may not only lower the risk of neural tube defects but also reduce the risk of certain childhood cancers, may increase adherence to existing supplementation recommendations."

Read the article here.

A systematic review of residential proximity to upstream oil and gas development and childhood, adolescent and young adult cancer risk

Eric C. Stewart, Nicholaus P. Johnson, Cassandra J. Clark, Catherine Metayer, Nicole C. Deziel

"We should not wait for more decades of research to take action to prevent childhood cancers, reduce potential exposures that may impact morbidity and mortality in survivorship, or improve our ability to communicate with families about these issues."

–Dr. Mark Miller, MD, MPH, *CCEP Program Lead*

Reaching New Heights, continued

GROWTH IN VISITORS AND SUBSCRIBERS:

Media

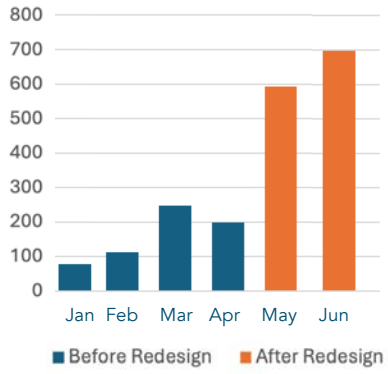
The CCEP is garnering more attention in the popular medias. This year, the program saw mentions in **15 news articles** and **one podcast**, branching out into new media outlets like ***Time* magazine**.

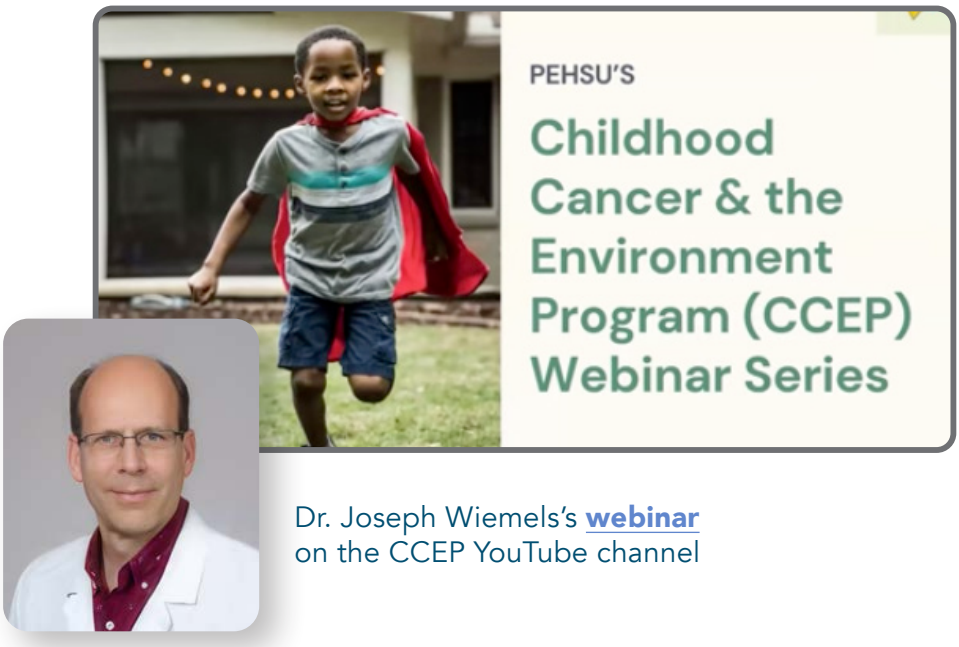
Website

We moved our primary CCEP website from Region 9 to the National PEHSU site and expanded **our program website** from **one page to 7 pages** in 2026. There are dedicated pages for families and communities, community health workers, and clinicians. These efforts resulted in an **over 600% increase in website visitors** from January to July 2026. Since the launch of the redesign, **the CCEP page** is the **second most viewed on pehsu.net** behind the home page. We also translated the pages into Spanish.

Scan the code to visit the CCEP website.

CCEP website views





Dr. Joseph Wiemels's **webinar** on the CCEP YouTube channel

Webinars

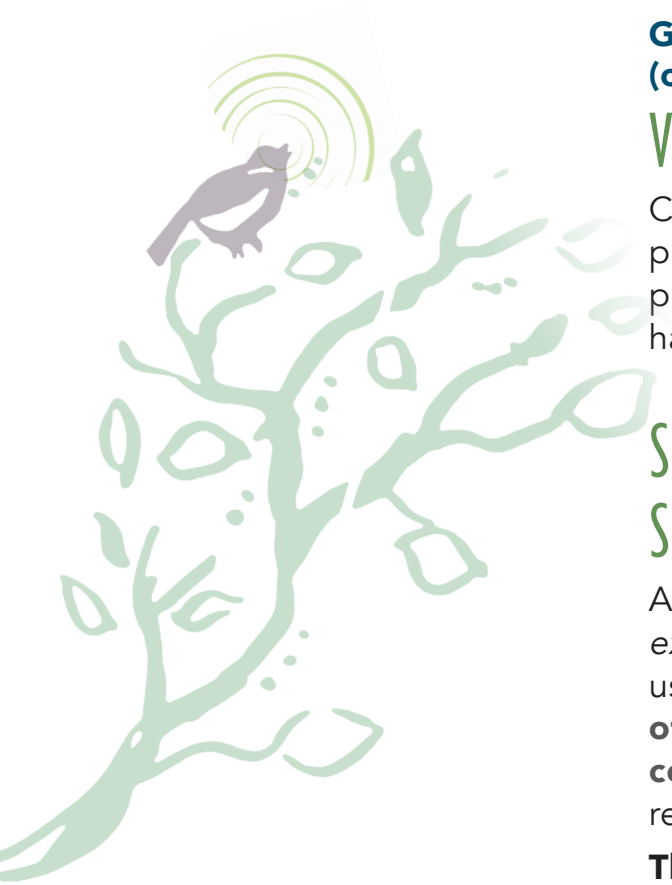
The CCEP has a regular webinar series (every other month) which is hosted by Region 2 PEHSU CCEP faculty Hannah Thompson and Perry Sheffield . These are programs with engaging, cutting-edge science presentations that have had **338 attendees this year from around the country**. Attendees come from academic institutions, state, federal, and tribal agencies, the advocacy community, and the general public.

Our CCEP faculty have given invited webinars and workshops sponsored by other groups throughout the year with over **1,000 attendees**.

Recordings of this year's CCEP webinars are on YouTube. **These recordings doubled the reach of the webinars totaling over 750 people reached**. Dr. Joseph Wiemels's webinar on **Environmental exposures during the prenatal and perinatal period and pediatric cancer risk** has gained the most views.

> "Support in science starts with comfort and knowledge of what science can do."
>
> – Dr. Joseph Wiemels, PhD, *molecular epidemiologist, University of Southern California and CCEP faculty*

Reaching New Heights, continued



GROWTH IN VISITORS AND SUBSCRIBERS (continued):

Videos

CCEP has produced **10 short science videos** for the professional audience and short videos for the general public and use by community health workers. These have been **viewed by over 1,000 individuals**.

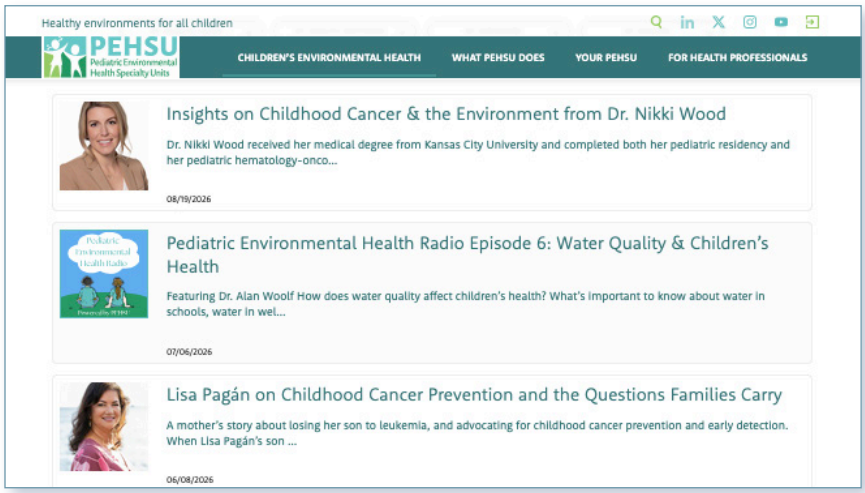
Social Media Engagement & Search Engine Visibility:

An online query: "*Are environmental chemical exposures linked to childhood cancer?*" The results, using articial intelligence (AI), revealed **at least 7 of the 22 citations are from CCEP faculty and collaborators**, showing that CCEP is a highly visible resource in this topic.

The top 3 posts about CCEP on PEHSU's LinkedIn page gathered 1,381 views collectively:

- **Promotion of a blog** with a recording for the CCEP webinar featuring Dr. Nicole Deziel from Yale University, who discussed the latest epidemiologic evidence on the health effects of Unconventional Oil and Gas wells (UOG) on children.
- **Bilingual promotion of a CCEP webinar** with PEHSU Murcia.
- **A quote from Dr. Mark Miller** about pesticides and childhood cancer from an article in *Nation of Change*. This post also promoted the webinar with Dr. Omar Shakeel and Dr. Nikki Wood.

> "It adds to an abundance of literature identifying pesticide exposure during pregnancy and childhood as a risk factor for childhood cancers. Reducing children's exposure to pesticides will help to prevent cases of childhood cancers."
>
> – *Dr. Mark Miller, quoted in US Right to Know article, "Pesticide use around homes and farms linked to childhood leukemia, brain tumors"*



CCEP blog page

Blog

CCEP launched a **blog series** highlighting subject matter experts and events in **11 blog posts** this year.

Newsletters

News and events on CCEP is published every other month for clinicians and the general public. This year **subscribers grew from 200 to 613**; more than tripling its reach over the year.

We also provide a newsletter for **community health workers** in English and Spanish. Each issue features a key theme such as pesticides, water, the immune system and other topics related to childhood cancer, along with a range of associated resources.

Find out more and sign up to receive our newletter **here** or by scanning the code.

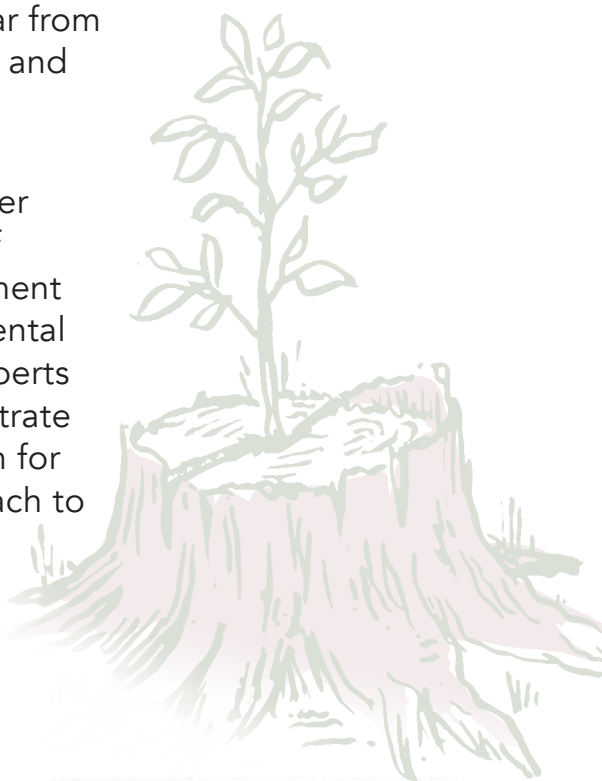
CCEP newsletter

Creating New Ecosystems

> "Everything we learn feels like a victory. It's such a wonder and an honor to be able to decipher the miraculous complexity of nature."
>
> –Dr. Joseph Wiemels, PhD, *molecular epidemiologist, University of Southern California and CCEP faculty*

The success of this program is reflected in the calls this year from others, including a **medical society**, **clinician researchers**, and **NGOs**, for new attention to childhood cancer prevention.

For the coming year, we will continue our current efforts highlighted in this document and launch a Childhood Cancer and the Environment Scholars Program in which a cohort of pediatric oncologists will get advanced training and implement a project within their home divisions to integrate environmental health directly within clinical settings. As acknowledged experts on childhood cancer, these vanguard clinicians will demonstrate the value of this work. We will also hold our first symposium for primary care providers. These efforts will expand our outreach to clinical communities across the country and help us make a preventive approach to childhood cancer a reality.



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PEHSU Pediatric Environmental Health Specialty Units

pehsu.net

The Pediatric Environmental Health Specialty Units (PEHSU) are supported by cooperative agreement FAIN: NU61TS000356 from the Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (CDC/ATSDR) totaling $8,724,963.00 with 75% funded by CDC/ATSDR. The U.S. Environmental Protection Agency (EPA) provided the remaining support through Inter-Agency Agreement 24TSS2400078 with CDC/ATSDR. The Public Health Institute supports the Pediatric Environmental Health Specialty Units as the National Program Office. The content on this website does not necessarily represent the official views of, nor an endorsement, by CDC/ATSDR, EPA, or the U.S. Government. Use of trade names that may be mentioned is for identification only and does not imply endorsement by the CDC/ATSDR or EPA.

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