The episode of increased lead levels in the Flint Michigan water supply in 2014-2015 has been in the national spotlight many times in the last few years. Many Americans were appalled at the reported conduct of public officials in causing and handling the problem. Now the publication of a new study of blood lead levels in children in Pediatrics by Hernan Gomez and colleagues has concluded that the lead exposures did not really constitute a public health crisis as portrayed. A potentially new narrative about Flint may be emerging.

Not Poisoned

In further elaborating a different perspective, Gomez and University of Cincinnati epidemiologist Kim Dietrich, a lead expert, published in the New York Times in late July an op-ed article entitled “The Children of Flint Were Not Poisoned”. They state “…the furor over this issue seems way out of proportion to the actual dangers to the children from lead exposure.” So if not a public health crisis, what did take place in Flint?

New Books

The new study comes at the same time as publication of two books describing the Flint episode. One book called “What The Eyes Don’t See” is by Mona Hanna-Attisha, the pediatrician who succeeded most in bringing public attention to the problem. The second book takes a broad, multi-factoral view of the underlying causes of the episode by Detroit writer Anna Clark. It is entitled “The Poisoned City: Flint’s Water and the American Urban Tragedy”. Both books have received favorable reviews in the New York Times.

- Flint cont'd on page 2
The books, the new study, an accompanying editorial, and the op-ed article are provoking controversy around the use of the word “poisoned” to characterize what happened to the children in Flint. They raise questions in retrospect about what should have been the appropriate response to the findings in Flint. Calling a situation a crisis is diametrically different from seeing it as a success and impacts any responses.

Initial Findings

The findings which triggered the declaration of a public health emergency were those from Hanna-Attisha’s study showing what percentage of children under five had blood lead levels above the CDC reference level of 5 micrograms before and after the switch to water from a different source.

[According to CDC, the reference level of 5 micrograms per deciliter is based on the U.S. population of children ages 1-5 years who are in the highest 2.5% of children when tested for lead in their blood. The 5 micrograms level is not an established threshold at which children are poisoned by lead. No safe blood lead level in children has been established.]

According to Gomez, who is a medical toxicologist, considering both the amount of exposure and the length of time exposure occurs are important considerations in evaluating lead toxicity.

In Hanna-Attisha’s studies, the percentages of children with blood lead levels above the reference level rose from 2.1% to 4% in an initial study and from 2.4% to 4.9% in a later study. In findings from the Michigan Department of Health and Human Services, children under sixteen showed an increase from 2.37% before the water switch took place to 3.21% afterwards.

New Study

In the new study published in June 2018, Gomez and colleagues evaluated the percentage changes in blood lead levels above the reference level in children under five. They did this over an 11 year period inclusive of years before, during, and after the switch back to the original water supply in 2015.

They found a significant long-term decline in the percentages of children with levels above the reference level from 11.8% in 2006 to 3.2% in 2016, a 72.9% decrease. In studying actual blood lead levels or mean geometric titers (GMT’s) over this 11 year period, Gomez and colleagues found a linear 50.6% decrease from 2.33 in 2006 to 1.15 in 2016. The decreasing linear trend suggested that random variation rather than increased lead exposures might best account for some of the titer changes measured over the eleven year period, including the increases observed during the period when the Flint water source was switched.

According to Gomez and co-authors, “The random variability of the data suggests that, whereas no child should have been unnecessarily exposed to drinking water with elevated lead concentrations, changes in geometric mean blood lead levels in young children in Flint Michigan during the
Flint River water exposure did not meet the level of an environmental emergency.”

**Health Scare?**

If not an emergency, what was it? An overblown, unfounded health scare? A real problem nevertheless? A warning sign about urban area problems? A harbinger of future water system challenges? A case-study in mismanagement? So far there seems to be no agreed upon or clear answer to these questions.

**Toxicohistrionics**

An editorial in Pediatrics accompanying the Gomez report suggests it might be an example of “toxicohistrionics” defined as “public and professional overreactions to substances in our food chain or environment where real risk has been exchanged for theoretical risk.” The editorialist, William Banner, current President of the American Association of Poison Control Centers, goes on to state that “reporting in the media and publication never gave us a real sense for the degree of ‘crisis’.”

**Difficult Message**

Gomez and Dietrich were well aware that differences between the casual use of the word “poisoned” and the nuances of the medical and scientific application of the word, (that is to say “permanent brain damage”) would not be well received by a fair portion of the Times’ lay readership. No child deserves to be exposed to lead, said Gomez, but those making an extra effort to understand can see that a true poisoning (i.e., permanent brain damage) did not take place. Gomez believes the op-ed was successful in sending an important message, and told the Monitor he has received expressions of gratitude from health professionals across the country.

**Public Health Success**

In seeking to describe the Flint situation in the context of their long-term observations, Gomez and Dietrich call the 11 year decline in blood levels in Flint children a “public health success” even when taking into account the change in the water supply. They conclude, “It is therefore unfair and inaccurate to point a finger at Flint and repeatedly use the word “poisoned”. All it does is terrify the parents and community members here who truly believe there may be a ‘generation lost’ in this city, when...
there is no scientific evidence to support this conclusion.”

Why The Overreaction?

If indeed the reactions in Flint were excessive given what appears to be the low level of real risk, what caused such an exaggerated response? Part of the answer may be found in the social and economic conditions and distrust existing in Flint prior to 2014-15 which primed everyone to believe the worst. These conditions are extensively documented in the book by Anna Clark.

In an interview with The Epidemiology Monitor, Clark was quick to recognize the difficulty of identifying a single label or pinpointing a cause for what she called the “violence” that the Flint population was exposed to. “Flint has suffered so many amorphous harms and indignities in the past,” she said, “it was a relief during the lead episode to be able to point to it as a kind of validation by the outside world for the multiple concerns of the community.”

Other factors have also been elucidated in case studies of electromagnetic fields, radon and passive smoking by Geoffrey Kabat in his book entitled “Hyping Health Risks”. He warns that “Ultimately, by failing to put certain potential hazards in perspective, one confuses the public and diverts attention from issues that may be far more important.”

Right Label

As noted by Clark, the Flint story is now moving from the realm of “news” to the realm of “history.” What remains unclear is what will become the definitive narrative of what happened in Flint. This is important as it will guide the lessons learned from the experience. Also, as pointed out by Gomez and Dietrich in their op-ed piece, words are toxic too, and the potential toxicity of words used about the children deserve serious consideration just as the potential toxic effects of lead in their water.
The latest CDC report from the US Zika Pregnancy and Infant Registry estimates the risk of children having a Zika-associated birth defect, a neurodevelopmental abnormality possibly associated with congenital Zika infection, or both at 14% or 1 in 7 children. More specifically, 6% of children had a Zika-associated birth defect, 9% had one or more neurodevelopmental abnormality possibly associated with congenital Zika virus infection, and 1% had both.

Underestimate

This estimate comes from follow-up of a group of 1,450 children aged one year or older born to mothers with laboratory evidence of confirmed or possible Zika virus infection during pregnancy. Since only 68% of the children had some follow-up care, not all children had all of the recommended evaluations, and the full spectrum of possible defects is not yet known, it is likely that these estimates are lower than the true number of negative outcomes.

Follow Up

Careful monitoring is considered important for these children since early detection of problems can result in early referral for interventions that can be beneficial especially in the first three years of life.

Transmission Down

Transmission of Zika virus is much lower in the Americas in 2018 than it was at the height of the outbreak in 2016 and later in 2017. Since 2015, CDC has registered a total of 5,716 cases in the United States, most of them (5,430) in travelers returning from affected areas. In the US Territories, CDC has recorded 37,262 cases, most of these (37,115) acquired locally through mosquito transmission. Cases have fallen dramatically in 2017 and 2018. There have been only 34 cases in the US and 74 cases reported in the territories so far this year. Zika is still a threat internationally and travelers should inquire to learn if they are going to a risk area.

Do you have news about yourself, a colleague, or a student?

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people@epimonitor.net

"Careful monitoring is considered important for these children..."
Report From National Academy of Sciences Makes Recommendations Promoting More Open Science

“Harnessing today’s stunning, ongoing advances in information technologies, the global research enterprise and its stakeholders are moving toward a new open science ecosystem.” With this description of a new reality for scientists in mind, the National Academy of Sciences has developed the concept of “Open Science By Design”.

Framework

The framework is defined as a set of principles and practices that fosters openness throughout the entire research life cycle with the overarching principle being that research conducted openly and transparently leads to better science. The assumption is made, according to the report, that “all phases of the research process provide opportunities for assessing and improving the reliability and efficacy of scientific research.”

Steps for Researchers

Open Science by Design is further described in the report as comprising the following steps for researchers to take.

- Provocation: explore or mine open research resources and use open tools to network with colleagues.
- Ideation: develop and revise research plans and prepare to share research results and tools under FAIR principles (Findable, Accessible, Interoperable, Reusable).
- Knowledge generation: collect data, conduct research using tools compatible with open sharing, and use automated workflow tools to ensure accessibility of research outputs.
- Validation: prepare data and tools for reproducibility and reuse and participate in replication studies.
- Dissemination: use appropriate licenses for sharing research outputs and report all results and supporting information (data, code, articles, etc.).
- Preservation: deposit research outputs in FAIR archives and ensure long-term access to research results.

Benefits

The report promotes the concept of Open Science by noting several benefits and expecting that these will continue to expand going forward. The benefits of Open Science are considered to include:

1) Strengthening rigor and reliability
2) Increased ability to address new questions
3) Faster and more inclusive dissemination of knowledge
4) Broader participation in research
5) More effective use of resources
According to a CDC press release, the agency has produced a graphic novel to help young people understand the potential health risks of influenza viruses that normally circulate in swine and can cause disease in people (known as variant flu infections). While variant flu infections in people are rare, they can sometimes lead to serious illness, including hospitalization and death.

Education/Inspiration

“We are very excited to share this graphic novel with the public and hope that it helps educate people about variant flu and how best to prevent flu viruses from spreading between animals and people,” said Douglas Jordan, a health communications specialist in CDC’s Influenza Division who co-wrote the novel and managed the project. “We also would love for our graphic novel to inspire the next generation of disease detectives.”

Collaborators

CDC developed the graphic novel in collaboration with the U.S. Department of Agriculture (USDA) and 4-H, the youth development organization affiliated with USDA. The novel follows a group of teenage 4-H members who participate in a state agricultural fair and later attend CDC’s Disease Detective Camp in Atlanta.

When one of the boys becomes sick following the fair, the rest of the group uses its newly acquired disease detective skills to help a team of public- and animal-health experts solve the mystery of how their friend became sick. The graphic novel was developed at CDC and illustrated by Bob Hobbs, the artist who illustrated CDC’s Zombie Pandemic graphic novel.

Free

The graphic novel, “The Junior Disease Detectives: Operation Outbreak,” is available for free download from the CDC flu website and the Apple iBook store.

Educational Activities

CDC collaborated with teachers participating in its Science Ambassador Fellowship to develop educational activities to accompany the graphic novel for use in middle and high school science, technology, engineering, and mathematics (STEM) classrooms across the country.

- CDC cont’d on page 8
Earlier this year, the CDC Science Ambassador Fellowship piloted the first of these activities with over 120 middle and high school STEM teachers. This activity is being released with the graphic novel, and the program plans to roll out additional classroom activities throughout the 2018-2019 school year.

The graphic novel and its associated curriculum is part of a broader CDC initiative with USDA and other agricultural partners to raise awareness, knowledge, and understanding of a One Health approach to zoonotic disease prevention and response. A One Health approach recognizes that the health of people is connected to the health of animals and the environment.

Barriers

The report acknowledges that science today is not completely open and that sharing data is not routine across all disciplines. The barriers to fuller implementation of the Open Science vision include costs, missing institutional infrastructure, the current structure of how scholarly communications are disseminated, a non-supportive culture that exists now, proprietary concerns, the need for privacy and security protections, differences in how disciplines view sharing, the large size of some datasets, and the need for safeguards against misuse or misrepresentation of data.

To access the full NAS report, visit: https://bit.ly/2O0Jhec

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Notes on People

Retiring: Patricia Quinlisk, Iowa’s medical director and state epidemiologist, in September 2018. She told the local paper “I’ve never gotten bored in this job because every day there is something new, something you have to sort of figure out and some things you have to try things on and see if they work, and if they don’t, then you switch gears and you try something else.”

Honored: Jeff Band, with the Michigan Medicine Alumni Distinguished Service Award to be given at a banquet in October 2018. The award recognizes outstanding contributions to the medical community and public health by Michigan graduates. Dr Band was Corporate Director of Health Care Epidemiology at Beaumont Health Systems. Currently he is professor of medicine at Oakland University William Beaumont School of Medicine and Wayne State University School of Medicine.

Awarded: to Claudia Langenberg, a Hemholz International Fellow Award to be given in November 2018. Dr Langenberg will receive 20,000 Euros in prize money and will be invited to conduct research at the Hemholz Zentrum in Munich. She currently is at the University of Cambridge with the MRC Epidemiology Unit.

Died: Edson Albuquerque, at age 82. He was a University of Maryland epidemiology and public health professor who researched the treatment of Alzheimer’s disease. According to Jay Magaziner, chair of the Department of Epidemiology at Maryland, “Edson was an outstanding scientist and colleague who had tremendous wisdom and worked tirelessly.” Another called him “truly an international research star.”

Elected: Bertha Hidalgo, as an officer on the Board of Directors of the American College of Epidemiology. Dr Hidalgo is currently an assistant professor in the Department of Epidemiology in the School of Public Health at the University of Alabama at Birmingham. She is also an associate scientist in UAB’s Nutrition Obesity Research Center.
Every December The Epidemiology Monitor dedicates that issue to a calendar of events for the upcoming year. However that often means we don't have full information for events later in the year. Thus an online copy exists on our website that is updated regularly. This year we will print upcoming events in the Monitor monthly. To view the full year please go to: [http://www.epimonitor.net/Events](http://www.epimonitor.net/Events)

## September 2018

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<td>September 12-14</td>
<td><a href="https://tinyurl.com/y87jdve">https://tinyurl.com/y87jdve</a></td>
<td>Conference: 2018 MCH (Maternal Child Health) Epidemiology Conference / CityMatch / Portland, OR</td>
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<td><a href="https://tinyurl.com/y82i85vk">https://tinyurl.com/y82i85vk</a></td>
<td>Short Course: Nondetects and other Types of Missing Data / University of Basel / Basel, Switzerland</td>
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<td>September 23-27</td>
<td><a href="https://tinyurl.com/ybkrgl4g">https://tinyurl.com/ybkrgl4g</a></td>
<td>Conference: 10th Union for Health Promotion and Education European Conference and International Forum for Health Promotion Research / Multiple Sponsors / Trondheim, Norway</td>
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<td><a href="https://tinyurl.com/y8jb7ac4">https://tinyurl.com/y8jb7ac4</a></td>
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<td><a href="https://tinyurl.com/lt9axvg">https://tinyurl.com/lt9axvg</a></td>
<td>Short Course: International Course in Applied Epidemiology with Epi Info Training / Emory University / Atlanta, GA</td>
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<td>Short Course: Advanced Course in Epidemiological Analysis / London School of Hygiene &amp; Tropical Medicine / London, England</td>
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## October 2018

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<td><a href="https://tinyurl.com/ybtlkjpvw">https://tinyurl.com/ybtlkjpvw</a></td>
<td>Short Course: Genetic Epidemiological Research Methods / Erasmus MC / Rotterdam, The Netherlands</td>
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<td>October 3-7</td>
<td><a href="http://www.idweek.org/">http://www.idweek.org/</a></td>
<td>Conference: IDWeek 2018 (Infectious Disease Week) / Multiple Sponsors / San Francisco, CA</td>
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<td>October 16-20</td>
<td>Short Course: Clinical Translation of Epidemiology</td>
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<td>October 17-19</td>
<td>Conference: ECVPH Annual Conference</td>
<td>European College of Veterinary Public Health &amp; University of Perugia</td>
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<td>October 22-24</td>
<td>Conference: Annual Scientific Meeting</td>
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**Symposium on Causal Methods in Epidemiological Studies of Particulate Matter and Mortality**

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- Causal Estimates of the Relationship between Fine Particulate Matter and Mortality using Attainment Status under the Clean Air Act Amendments.  
  Matt Neidell, Columbia University; Nicholas Sanders, Cornell University; Alan Barreca, UCLA

- The Impact of PM$_{2.5}$ on Mortality Evidence from a Natural Experiment.  
  Yi Wang, Indiana University; Maoyong Fan, Ball State University

- A Counterfactual Approach to Quantify the Causal Effect of Fine Particulate Matter on Mortality Using a Novel Approach.  
  Zhengyuan Zhu, Iowa State University; Zhulin He, Iowa State University; Richard Smith, University of North Carolina at Chapel Hill

**Keynote Speaker:** Daniel S. Greenbaum, Health Effects Institute

For more information, please visit [http://pmcausalitysymposium.org/](http://pmcausalitysymposium.org/)
The UCLA Jonathan and Karin Fielding School of Public Health invites applications for a full-time, state-funded tenure-track Assistant or tenured Associate Professor of Epidemiology (https://epi.ph.ucla.edu). The ideal candidate will have a strong, emerging record of an innovative and productive research program in mental health epidemiology, including mental health, substance use, and/or psychiatric disorders, and a history of successful external funding, consistent with career stage. The successful candidate should also have a strong track record and dedication to teaching foundational and advanced epidemiology courses (e.g., introductory epidemiology, population health, measurement, research methods, and/or study design), as well as courses in the candidate’s specialty area. We are looking for a candidate with excellence in research and dedication to teaching and training the next generation of epidemiologists in areas such as, but not limited to, epidemiologic studies of mental health and substance use, randomized clinical trials for psychiatric disorders, psychiatric genetics, psychopharmacology, mental health comorbidities with infectious or other chronic diseases, and/or mental health-related studies using “big data” (e.g., omics, electronic health records, administrative databases, internet-based data).

Successful candidates must have (or be on track to conclude before July 1, 2019) a doctoral degree (PhD, ScD, MD, DrPH or equivalent) in Epidemiology or related field, demonstrable expertise and interest in epidemiologic research, evidence of excellence in teaching and training of pre- and/or post-doctoral students, peer-reviewed publications, and a demonstrated commitment to public health. Faculty appointment level and salary will be commensurate with the candidate’s experience and qualifications.

The deadline for applications to be submitted is November 1, 2018 but the search remains open until the position is filled. The anticipated start date is July 1, 2019. Informal inquiries may be submitted to episearch@ph.ucla.edu
Please submit your applications at: https://recruit.apo.ucla.edu/apply/JPF03945

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The Division of Intramural Population Health Research (DIPHR) of the Eunice Kennedy Shriver National Institute of Child Health and Human Development is recruiting a Senior Investigator to serve as Chief of the Biostatistics and Bioinformatics Branch (BBB). The BBB mission is to develop novel biostatistical and bioinformatics methods motivated by the Division’s population health research that spans human fecundity and fertility, pregnancy, child and adolescent development, and health-related behaviors. BBB currently has methodological research programs in the areas of analysis of biomarker data, analysis of time-to-event data, and analysis of longitudinal and correlated data. A description of the Branch may be found at https://www.nichd.nih.gov/about/org/diphr/officebranch/bbb.

The Branch Chief will shape the research direction of BBB and provide scientific, administrative and fiscal leadership of the Branch while maintaining his/her own original methodologic and collaborative research. The successful candidate will be a dynamic leader, an internationally recognized methodologist whose accomplishments are commensurate with the academic rank of a tenured full professor as demonstrated by a strong upward trajectory of high quality statistical publications, a trajectory of high impact collaborative publications, extramural funding (for academic candidates), and a clear vision of BBB’s essential role in population health research. The Chief is expected to lead in strengthening current research areas and in developing new areas of expertise to address increasingly challenging designs and analyses, including priorities such as bioinformatics and causal inference in areas central to the Institute’s mission.

APPLY
The full position description and instructions for applying may be found at https://www.nichd.nih.gov/sites/default/files/2018-08/DIPHR_BBB_Chief_Position.pdf. For further information about the position please contact Dr. Stephen Gilman, Senior Investigator and Chief, Social and Behavioral Sciences Branch, DIPHR, NICHD; Phone: 301-435-3895; Email: stephen.gilman@nih.gov. Applications received by November 1, 2018 will be considered for a first round of interviews, but applications will be accepted until the position is filled.

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The DAN Director of Injury Monitoring and Prevention will be responsible for monitoring the incidence and trends of dive injuries; studying causes of injuries; developing, evaluating and implementing preventive interventions and advising industry leaders regarding the prevention of dive injuries. Responsibilities include directing daily activities regarding incidence, injuries and fatalities data collection and exploring additional sources of data. The position, based in Durham, North Carolina, will require supporting DAN initiatives, publishing scientific papers, writing articles for lay publications and lecturing at scientific and professional conferences, dive shows and other public events for divers and related professionals.

**DUTIES/RESPONSIBILITIES**

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- Conduct epidemiological analysis of dive injuries
- Assist with epidemiological analysis of insurance-loss data
- Identify the most common causes of dive injuries
- Conduct data analysis and write chapters for the **DAN Annual Diving Report**
- Design and develop epidemiological studies and preventive interventions
- Provide a plan and documentation for project implementation
- Monitor project progress, compile annual reports, and publish scientific papers
- Participate in companywide initiatives and public education efforts

**EDUCATION/TRAINING**

- MD or doctoral degree in population health or epidemiology, with the appropriate research background in dive safety, dive physiology and dive injuries
- Advanced diving experience

**SKILLS**

- Project management
- Research design and implementation
- Epidemiological and statistical methods
- Scientific writing
- Writing for lay publications
- Public speaking

To apply, send a letter and CV to: [jobs@dan.org](mailto:jobs@dan.org) or

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