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Health and Human Services Agency
California Department of Public Health

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Ankita S. Kadakia, M.D., Interim Public Health Officer
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County of San Diego Health & Human Services Agency
By email: ankita.kadakia@sdcounty.ca.gov

Dear Dr. Kadakia:

At the request of San Diego County Public Health Services (SDCPHS), California Department of Public Health (CDPH) conducted an independent review of the work that SDCPHS did to assess the August 2023 reports of increased infectious gastrointestinal illness at one clinic in the county.

The report attached describes our validation of SDCPHS's finding that, after cleaning the data to remove duplicates and ensuring valid comparison to other time periods, an increase in gastrointestinal illness in the population served by the clinic during August 2023 cannot be confirmed.

We recommend that SDCPHS continue syndromic surveillance efforts, collaboration with federal partners, tracking emerging literature, and ensuring timely, accessible, and accurate public information.

Very truly yours,

June Weintraub, ScD, REHS
State Environmental Health Director

CDPH Review of SDCPHS November 2023 response to reports of increased infectious GI Illness

1. Background

For decades, wastewater discharges and other pollution in the Tijuana River Valley has presented environmental and public health problems to communities on both sides of the Mexico-US border. A history of this situation is described and summarized in the 2022 Minute No. 328 report from the International Boundary Water Commission.

In the fall of 2023, concurrent with the publication of a scholarly manuscript documenting the presence of bacteria in sea spray aerosol in the Imperial Beach area of San Diego County, an urgent care clinic in the Imperial Beach area of San Diego County publicized a graphic of increased GI illness complaints following Tropical Storm Hilary in August 2023. This generated new public concern of gastrointestinal disease transmission via contaminated wastewater spillover from the Tijuana River during periods of heavy precipitation.

In response to the local clinic's reports of increased GI illness, San Diego County Public Health Services (SDCPHS) reviewed the data reported by the clinic in fall of 2023. Chart abstraction from clinic data revealed that symptom complaint code counts rather than case counts were used in the clinic's 2023 report; as a result, most cases were doubly or triply counted by the clinic. Additionally, the clinic's inclusion of non-specific codes for infectious GI illness and of patients diagnosed with a non-GI illness likely exacerbated this overestimation. GI illness can be caused by many factors, and medical chart review revealed that patients who did not have clinical evidence of infectious gastrointestinal illness were erroneously counted. For example patients with post-tussive vomiting and dyspepsia/gastritis—responding in the clinic to an oral lidocaine/antiacid treatment—were included in the case counts.

As follow-up, SDCPHS conducted a real-time surveillance project in the clinic in February 2024, shortly after a period of rain and flooding, to assess the occurrence of GI illness and potential relationship with exposure to sewage-contaminated flood waters from the Tijuana River. Patients suspected of infectious GI illness in the clinic were referred to SDCPHS clinicians on site who conducted stool testing and exposure interviews. Charts for all patients with ICD-10 codes indicating GI illness were reviewed by a SDCPHS physician. In addition, SDCPHS compared syndromic data for GI illness in the region versus the whole county.

2. CDPH Review of SDCPHS Response

After independently reviewing SDCPHS methods and findings, CDPH concurs with the assessment that there was likely not an increase in infectious GI illness during either of the periods in question. SDCPHS conducted a comprehensive evaluation of the clinic's surveillance and data analysis methods. Regional syndromic surveillance data did not suggest any appreciable increase in syndromic GI illness reports in this region compared to the county as a whole. Although syndromic surveillance typically utilizes emergency department/clinic visit complaints rather than verified clinical illness, it is a valid tool to detect early rate changes of disease.

3. CDPH Review of Literature Regarding Sea Spray Aerosol and Infectious Risk

We reviewed the 2023 study (Pendergraft et al., 2023) that built on previous work by the same researchers. The study is useful for understanding the environmental conditions created by untreated sewage flows to the Tijuana River and the Pacific Ocean. This study reported that aerosolization from the Tijuana River is minimal due to the direction of the wind and identified specific bacteria in sea spray aerosol that could be used as tracers of sewage contamination from the river to the ocean. This study made no determinations about whether or not the airborne bacteria were infectious or viable.

We reviewed scholarly reports, studies, and documents to assess the state of the science on the potential for a causal association between sewage contaminated sea spray aerosol exposures and risk of health outcomes. The evidence that gastrointestinal illness outbreaks can be caused by inhalation of contaminated aerosols is limited to settings where vomit from an infected individual is aerosolized and the concentration of infectious material in the aerosols is comparatively high (de Graaf et al., 2016). We are not aware of any evidence that disease transmission can occur to those exposed to the concentrations of aerosols reported by Pendergraft et al.

There is no human health standard for bacterial inhalation. Neither the World Health Organization nor the U.S. Environmental Protection Agency define or give guidance on any health risk associated with inhaling bacteria. More studies regarding sea spray aerosols and how they affect ocean, inland, and coastal environments need to be established to support any causality between exposure to sewage-contaminated sea spray aerosol and development of infectious gastrointestinal illness. As evidence emerges, any causal inferences should take into consideration epidemiologic evidence and presence of known causal factors for gastrointestinal illness, as well as factors that influence variability in exposure, such as temperature, land geography and time of day (Seifried et al., 2015, Graham et al., 2018, Shaffer & Lighthart, 1997).

4. Recommendations for SDCPHS

CDPH makes the following recommendations to SDCPHS:

1. Continue the robust syndromic and laboratory surveillance of GI infectious illness cases.
   - Although syndromic surveillance has limitations, it can be an early, sensitive indicator of local disease trends.
   - Any supplementary reporting from clinical settings should be evaluated to ensure that duplicates are removed and case definitions are consistent.
2. Stay apprised of new scholarly work on the biological plausibility of a causal link between inhalation of aerosols containing bacteria or virus and development of infectious gastrointestinal illness.
3. Continue to collaborate with the Centers for Disease Control and Prevention (CDC) and other federal partners as appropriate.
4. Provide timely, plain language updates to the impacted community to keep residents informed about public health risks or lack thereof.

5. Bibliography

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