

Utah Health Status Update:

Four Corners States Biomonitoring Consortium (4CSBC) Update

August 2019

In 2014, four states (Arizona, Colorado, New Mexico, and Utah) formed the Four Corners States Biomonitoring Consortium (4CSBC). The consortium objectives were to demonstrate the ability of regional collaboration; increase biomonitoring capacity; and collect data on exposure to certain heavy metals, phthalates which are found in plastics, pesticides, and contaminants of consumer products. Exposure was measured by testing for metabolites of environmental chemical contaminants in urine donated by participants. Metabolites are products produced when the body processes the contaminants for excretion. For example, benzylbutyl phthalate is converted into mono-benzyl phthalate (MBzP) before excretion. It is hoped the information collected through biomonitoring will empower communities and policymakers to take action to reduce exposure to environmental hazards.

Table 1 presents descriptive findings among Utah participants based on urine samples. The National Health And Nutrition Examination Survey (NHANES) is conducted by the Centers for Disease Control and Prevention (CDC), which periodically tests for exposure to more

KEY FINDINGS

- Information collected through biomonitoring will empower communities and policymakers to take action to reduce exposure to environmental hazards.
- Distribution exposure levels for the active herbicide in "Agent Orange" (2,4-D) among Utah participants point to a need for more education about protecting applicators and the public from exposure while applying the herbicide.
- Nearly 10% of private well water systems had arsenic levels that exceed the current EPA standards. Many private well water systems also had high selenium levels, making those waters less palatable for color, smell, and taste.

Contaminant Levels Among Participants

Table 1. Descriptive findings of contaminant levels among Utah biomonitoring participants from 2014 through 2019.

Metabolites of Contaminates	NHANES 95th Percentile (µg/g)	Number of Samples Analyzed	Percent of Samples With Detectable Levels (%)	Percent of Samples With Levels Above NHANES 95th Percentile (%)
Heavy Metals				
Arsenic	50.4	279	88.2	2.5
Cadmium	0.907	279	49.8	1.1
Manganese	0.548	279	59.5	16.1
Mercury	1.75	279	70.9	1.1
Selenium	—	279	93.5	—
Uranium	0.029	279	66.7	9.7
Phthalates (Plasticizers)				
MBzP	26.7	261	85.8	3.4
MnBP	41.2	261	89.3	2.7
MiBP	27.5	261	89.7	6.1
MEP	541	261	90.4	0.8
MMP	11	261	74.7	5.4
MEHP	8.47	261	64.4	5.0
MEHHP	37.7	261	90.4	1.1
MEOHP	23.4	261	90.4	2.3
MECPP	59.8	261	90.4	0.4
MiNP	17.6	261	49.8	0.0
MCOP	194	261	82.0	0.0
MCNP	14.6	261	51.3	0.0
MOP	5,930	261	49.0	0.0
MCPP	36.6	261	85.4	0.0
MCOCH	—	261	33.0	—
MHNCH	1,570	261	31.8	1.5
Pyrethroids (Pesticides)				
3PBA	5.44	105	82.9	2.9
4F3PBA	<0.1	105	64.8	3.8
TDCCA	4.37	105	79.0	1.9
Contaminants 2,4-DCP & 2,5-DCP				
2,4-DCP	1.55	84	89.3	21.4
2,5-DCP	6.1	84	78.6	2.4

than 200 different environmental contaminants, including those tested for by the 4CSBC. The NHANES 95th percentile from the 2011–2012 NHANES survey season was used as a comparison value for evaluating the 4CSBC test results. The 2011–2012 NHANES was the most recent national exposure survey results available at the start of the study. The 95th percentile gives an idea of the distribution of contaminant levels in the normal, healthy, U.S. population. For interpretation, if five percent or fewer Utah

participants had levels above the NHANES 95th percentile, then the Utah population resembles the national population for exposure. If more than five percent of Utah participants were above the NHANES 95th percentile, then Utah has a higher exposure to those contaminants than the national population.

This higher exposure level was noted for manganese and uranium. Manganese exposure at clinical doses is associated with damage to the nervous system, while uranium is associated with damage to the kidneys. However, the NHANES 95th percentile level is not a clinical threshold of concern. It simply indicates typical exposures in the national population, and is often orders of magnitude below clinically important levels. Therefore, these results only suggest a higher exposure potential in Utah than nationally. It does not suggest Utah residents have a higher risk for brain or kidney damage. The consortium strictly avoided referencing clinical values because the project funding was limited to collecting population-based surveillance data. However, project staff did contact each participant with levels higher than the NHANES 95th percentile, reviewed the results with the participants, and discussed what could be done to reduce exposure.

For phthalates, pyrethroid pesticides, and the contaminant 2,5-DCP, the distribution of exposures among Utah participants matched the distribution of the national population. More interesting was the distribution of exposure levels among Utah residents for the contaminant 2,4-DCP. Participants were drawn from Utah residents in various communities and included both agricultural and non-agricultural workers. 2,4-DCP is a metabolite of 2,4-dichlorophenoxy acid (2,4-D), which is the active herbicide in “Agent Orange” and is now commonly used in agriculture on cereal crops. These findings point to a need for more education about protecting applicators and the public from exposure to 2,4-D while applying the herbicide.

Table 2 presents descriptive findings of private well water used as drinking water by some of the study participants. The private well samples are compared with public drinking water standards established by the U.S. Environmental Protection Agency (EPA). Arsenic is a known natural contaminant of some Utah groundwater sources. Public drinking water systems treat

Contaminant Levels Among Private Drinking Water

Table 2. Descriptive findings of contaminant levels among private drinking water samples provided by Utah biomonitoring participants from 2014 through 2019.

Contaminant	EPA Maximum Contaminant Level (MCL) for Drinking Water (µg/L)	Number of Samples Analyzed	Percent of Samples Analyzed With Detectable Levels (%)	Percent of Samples Analyzed With Levels Above the MCL
Heavy Metals				
Arsenic	10	129	55.0	9.3
Cadmium	5	129	14.7	0.0
Manganese	50*	129	49.6	0.8
Mercury	2	129	6.2	1.6
Selenium	50	129	45.7	13.2
Uranium	30	129	45.7	2.3

*Manganese does not have a primary MCL for potability. The value here is a secondary MCL which is recommended for appearance, taste, and odor.

water to remove heavy metals including arsenic. However, many private well systems do not have adequate or adequately maintained water treatment systems. Nearly 10% of private well water systems had arsenic levels that exceed the current EPA standards. However, preliminary exposure risk modeling did not indicate that private well water consumption was an important contributor to participant risk of exposure to contaminants. Risk modeling is ongoing and results will be made available in the fall at the website provided below. Many private well water systems also had high selenium levels, making those waters less palatable for color, smell, and taste.

For more information about biomonitoring, the 4CSBC, or the chemicals of concern that were tested during this five year testing cycle, readers are encouraged to visit www.4csbc.org. Since the consortium is no longer collecting participant samples, readers should work with their health care providers if they have personal exposure concerns and want to be tested. Readers can work with their local community utilities departments or local health department to determine how to get private well water tested. The consortium website has information on how the public can reduce their exposure to these environmental contaminants.

UDOH ANNOUNCEMENT

Under SB 150 Utah Statewide Stroke and Cardiac Registry, the Utah Bureau of EMS and Preparedness, through the Specialty Care Systems Program is mandated to create statewide stroke and cardiac registries and advisory committees to analyze the incidence, severity, cause, outcomes and rehabilitation associated with cardiac and stroke; promote optimal care for cardiac and stroke patients; alleviate unnecessary death and disability from cardiac and stroke diseases; encourage the efficient and effective continuum of patient care including prevention, prehospital care, hospital care, and rehabilitative care; and minimize the overall costs of cardiac and stroke care. See our website for more information: <https://bemsp.utah.gov/operations-and-response/specialty-care-vulnerable-populations/>.

For additional information about this topic, contact Sam LeFevre, 801-538-6191, slefevre@utah.gov; or the Office of Public Health Assessment, Utah Department of Health, 801-538-9191, chdata@utah.gov.

The Utah Cardiac Arrest Registry to Enhance Survival (CARES) Registry and Utah Resuscitation Academies

Each year, approximately 1,800 Utahns experience an out-of-hospital cardiac arrest or sudden death. The Cardiac Arrest Registry to Enhance Survival (CARES) Registry is a standardized national registry that currently covers approximately one third of the U.S. population and is expanding. Utah was one of the first states to adopt the CARES registry to help develop an accurate assessment of cardiac arrest resuscitation rates statewide. Adopting the registry enhanced the ability to evaluate care and measure the results of performance improvement efforts, such as the statewide Resuscitation Academies sponsored by the Utah Bureau of Emergency Medical Services and Preparedness. Academies are day long intensive trainings held regularly throughout the state for Emergency Medical Services (EMS) and Emergency Department personnel to teach the principles of High Performance Cardiopulmonary resuscitation (CPR) techniques. These techniques have resulted in markedly increased resuscitation rates for EMS agencies who implement them. These improvements in care are reflected in the Utah CARES Registry. Information compiled from the registry indicates that the Utah bystander CPR rate and automated external defibrillator (AED) rates are higher than the national average. Survival rates from cardiac arrest in Utah mirror the national average (Table 1).

Utah EMS officials intend to improve these resuscitation rates further through continued training for emergency care professionals in these evidence-based resuscitation techniques. In 2018, the Utah Legislature unanimously approved legislation which provides permanent funding for the Utah CARES Registry, allowing the state to continue to measure and improve the cardiac resuscitation care provided for Utah citizens. See our website for more information: <https://bemsp.utah.gov/operations-and-response/specialty-care-vulnerable-populations/>.

CARES Registry Statistics: Utah vs. U.S.

Table 1. Utah bystander CPR and AED rates were higher than the national average in 2018. Utah survival rates mirror the national average.

	2018 National CARES	2018 Utah CARES
Patients received bystander CPR	39.2%	40.5%
Patients who arrested had a bystander apply an AED	11.9%	15.2%
Patients survived to hospital admission	28.2%	25.5%
Patients survived to hospital discharge	10.4%	10.4%

Fentanyl Decontamination

Fentanyl is a synthetic opioid that is much more potent than heroin and morphine. Due to its low dose lethality and high-risk exposure pathways—inhalation, ingestion, or absorption—fentanyl poses a serious health hazard if not properly decontaminated. The Environmental Protection Agency (EPA) has previously developed best practices for remediation of former meth labs, however, guidelines for fentanyl are still in development. The EPA and the InterAgency Board have provided information on personal protective equipment and decontamination operations to protect first responders and others from sites with residual fentanyl contamination (Table 1). Bulk fentanyl can be removed by carefully transferring solids into appropriate containers and dry vacuuming residues with high efficiency particulate air (HEPA) filtration. Negative air machines can be used to reduce the spread of airborne fentanyl dust. For contaminated surfaces, pre-cleaning with soap and water may be needed before applying heavy-duty decontamination formulations. For fentanyl cleanup of hard surfaces and equipment, the InterAgency Board recommends using Dahlgren Decon solution, 5% peracetic acid, 10% hydrogen peroxide, or 12% dichlor/trichloroisocyanuric acid. Porous materials may need to be discarded. Properly dispose of contaminated personal protective equipment or decontaminate with soft brushes and a detergent/water solution with a pH between 8 and 10.5. For more information, visit www.interagencyboard.org/content/first-responder-ppe-and-decontamination-recommendations-fentanyl-august-2017 and www.epa.gov/sites/production/files/2018-07/documents/fentanyl_fact_sheet_ver_7-26-18.pdf.

InterAgency Board Recommendations for Decontamination Operations

Table 1. Personal protective equipment recommendations for protection against fentanyl.

	Potential Synthetic Opioid Exposure Risk		
	Moderate (large volume storage/distribution)	High (milling lab) [particulate]	High (production lab) [chemicals]
Skin Protection	<ul style="list-style-type: none"> Nitrile gloves, certified to National Fire Protection Association (NFPA) 1999 (Single Use Examination Gloves) Uniform Long sleeve and/or sleeve covers 	<ul style="list-style-type: none"> Multiple-use emergency medical protective ensembles (garments, gloves, and footwear), certified to NFPA 1999; or Class 4 or 4R protective ensemble (garment, gloves, footwear) certified to NFPA 1994 	<ul style="list-style-type: none"> Multiple-use emergency medical protective ensembles (garments, gloves, and footwear), certified to NFPA 1999; or Class 4 or 4R protective ensemble (garment, gloves, footwear) certified to NFPA 1994
Eye/face/respiratory Protection	<ul style="list-style-type: none"> P100 Filtering face piece respirator with non-vented or indirect vented goggles; Half mask air-purifying respirator (APR) with P100 filters and non-vented or indirect vented goggles; or full-facepiece APR with P100 filters 	<ul style="list-style-type: none"> Full-facepiece APR with P100 filters; powered air-purifying respirator (PAPR) with high-efficiency particulate air (HEPA) filter; or self-contained breathing apparatus, certified to NFPA 1981 	<ul style="list-style-type: none"> Full-facepiece APR with P100 filters; powered air-purifying respirator (PAPR) with high-efficiency particulate air (HEPA) filter; or self-contained breathing apparatus, certified to NFPA 1981

Monthly Health Indicators Report

(Data Through June 2019)

Monthly Report of Notifiable Diseases, June 2019	Current Month # Cases	Current Month # Expected Cases (5-yr average)	# Cases YTD	# Expected YTD (5-yr average)	YTD Standard Morbidity Ratio (obs/exp)
Campylobacteriosis (<i>Campylobacter</i>)	48	67	245	255	1.0
Shiga toxin-producing <i>Escherichia coli</i> (<i>E. coli</i>)	16	17	62	45	1.4
Hepatitis A (infectious hepatitis)	1	2	12	27	0.4
Hepatitis B, acute infections (serum hepatitis)	1	2	13	6	2.2
Meningococcal Disease	0	0	1	1	1.3
Pertussis (Whooping Cough)	6	45	102	275	0.4
Salmonellosis (<i>Salmonella</i>)	31	39	137	181	0.8
Shigellosis (<i>Shigella</i>)	4	5	23	24	1.0
Varicella (Chickenpox)	8	11	79	124	0.6
West Nile (Human Cases)	0	0	0	0	-
Quarterly Report of Notifiable Diseases, 2nd Qtr 2019	Current Quarter # Cases	Current Quarter # Expected Cases (5-yr average)	# Cases YTD	# Expected YTD (5-yr average)	YTD Standard Morbidity Ratio (obs/exp)
HIV/AIDS†	25	29	51	62	0.8
Chlamydia	2,759	2,248	5,529	4,659	1.2
Gonorrhea	616	498	1,271	985	1.3
Syphilis	89	62	187	125	1.5
Tuberculosis	7	6	13	13	1.0
Medicaid Expenditures (in Millions) for the Month of June 2019	Current Month	Expected/Budgeted for Month	Fiscal YTD	Budgeted Fiscal YTD	Variance - over (under) budget
Mental Health Services	\$ 12.7	\$ 12.8	\$ 165.1	\$ 166.6	\$ (1.4)
Inpatient Hospital Services	18.8	18.8	226.5	228.2	(1.7)
Outpatient Hospital Services	3.2	3.2	42.5	43.6	(1.1)
Nursing Home Services	21.9	22.6	281.2	282.7	(1.5)
Pharmacy Services	8.9	8.8	129.8	130.9	(1.1)
Physician/Osteo Services‡	3.6	3.4	65.4	65.8	(0.4)
Medicaid Expansion Services	27.1	26.5	148.3	149.9	(1.6)
TOTAL MEDICAID	246.1	248.1	2,854.0	2,856.5	(2.4)

† Diagnosed HIV infections, regardless of AIDS diagnosis.

Notes: Data for notifiable diseases are preliminary and subject to change upon the completion of ongoing disease investigations. Active surveillance has ended for influenza until the 2019–2020 season.

‡ Medicaid payments reported under Physician/Osteo Services does not include enhanced physician payments.

Program Enrollment for the Month of June 2019	Current Month	Previous Month	% Change [§] From Previous Month	1 Year Ago	% Change [§] From 1 Year Ago
Medicaid	287,141	288,632	-0.5%	275,743	+4.1%
CHIP (Children's Health Ins. Plan)	17,528	17,745	-1.2%	19,148	-8.5%
Commercial Insurance Payments [#]	Current Data Year	Number of Members	Total Payments	Payments per Member per Month (PMPM)	% Change [§] From Previous Year
Medical	2017	8,347,707	\$ 2,558,930,212	\$ 306.54	new measure
Pharmacy	2017	7,551,975	483,316,448	64.00	new measure
Annual Community Health Measures	Current Data Year	Number Affected	Percent/Rate	% Change [§] From Previous Year	State Rank ^{**} (1 is best)
Obesity (Adults 18+)	2018	618,400	27.8%	+10.1%	7 (2017)
Child Obesity (Grade School Children)	2018	38,100	10.6%	+11.6%	n/a
Cigarette Smoking (Adults 18+)	2018	200,100	9.0%	+0.9%	1 (2017)
Vaping, Current Use (Grades 8, 10, 12)	2017	32,000	11.1%	+6.3%	n/a
Binge Drinking (Adults 18+)	2018	236,700	10.6%	-7.7%	1 (2017)
Influenza Immunization (Adults 65+)	2018	182,300	52.0%	-7.1%	40 (2017)
Health Insurance Coverage (Uninsured)	2017	304,000	9.8%	+12.6%	n/a
Motor Vehicle Traffic Crash Injury Deaths	2017	280	9.0 / 100,000	+6.9%	14 (2017)
Drug Overdose Deaths Involving Opioids	2017	400	12.9 / 100,000	-7.2%	25 (2017)
Suicide Deaths	2017	663	21.4 / 100,000	+6.3%	46 (2017)
Unintentional Fall Deaths	2017	224	7.2 / 100,000	+7.2%	20 (2017)
Traumatic Brain Injury Deaths	2017	634	20.4 / 100,000	-8.4%	32 (2017)
Asthma Prevalence (Adults 18+)	2018	205,500	9.2%	+3.6%	15 (2017)
Diabetes Prevalence (Adults 18+)	2018	185,900	8.3%	+17.5%	6 (2017)
High Blood Pressure (Adults 18+)	2017	532,900	24.5%	+3.8%	3 (2017)
Poor Mental Health (Adults 18+)	2018	418,300	18.8%	+3.1%	22 (2017)
Coronary Heart Disease Deaths	2017	1,692	54.5 / 100,000	+1.8%	5 (2017)
All Cancer Deaths	2017	3,160	101.9 / 100,000	-0.4%	1 (2017)
Stroke Deaths	2017	888	28.6 / 100,000	-6.0%	21 (2017)
Births to Adolescents (Ages 15-17)	2017	420	5.8 / 1,000	-7.6%	13 (2017)
Early Prenatal Care	2017	37,395	77.0%	+2.3%	n/a
Infant Mortality	2017	282	5.8 / 1,000	+7.0%	24 (2017)
Childhood Immunization (4:3:1:3:3:1)	2017	35,600	70.2%	-4.6%	46 (2017)

§ Relative percent change. Percent change could be due to random variation.

Figures subject to revision as new data is processed.

** State rank based on age-adjusted rates where applicable.