



**CUYAHOGA COUNTY
MEDICAL EXAMINER'S OFFICE**

Thomas P. Gilson, M.D.
11001 Cedar Avenue
Cleveland, Ohio 44106

A National Association of Medical Examiner's (N.A.M.E.) accredited office.



EMBRGOED UNTIL Thursday, May 25th 2017 12:30 PM

TESTIMONY OF:

DR. THOMAS P. GILSON, CHIEF MEDICAL EXAMINER of CUYAHOGA COUNTY
HEARING OF U.S. SENATE PERMANENT SUBCOMMITTEE ON INVESTIGATIONS of the
Senate Committee on Homeland Security and Governmental Affairs
SUBJECT: PUBLIC HEALTH EMERGENCY STEMMING FROM OPIATE/OPIOID CRISIS

Good morning,

My name is Thomas P. Gilson and I am the Medical Examiner of Cuyahoga County. Thank you for allowing me to be here today to speak on this critical subject.

If I were to tell you that a major catastrophe that would kill tens of thousands of people in the U.S. this year, how would FEMA respond? How much money, people and resources would be put into action in response? If this catastrophe was allowed to happen again, with even more fatalities, how many hearings would be called to determine what went wrong in the response? The Opiate Crisis is a slow moving mass fatality event that occurred last year, is occurring again this year and will occur again next year. Each year getting worse than the previous. Cuyahoga County will see approximately 800 drug related deaths in 2017, an increase from the most devastating year we have ever had in 2016. Nearly 90% will be due to opiates and opioids of some kind: Prescribed pills - from which this crisis originated and grew out of, heroin, fentanyl or some new fentanyl analog. It is a nationwide public health emergency which is simply out of control. Ohio seems one of the hardest hit states but the Appalachian, Mid-Atlantic and New England states seem particularly hard hit.

In fall 2011, my office alerted our County Executive of an alarming trend of rising heroin-related deaths. In the subsequent months and now years, we partnered with our Sheriff, Cleveland Police, the US Attorney's Office, the County Prosecutor, the ADAMHS Board and our Board of Health to launch a community initiative to study and combat this public health crisis. Quickly, partners were added to include the major medical institutions Cleveland Clinic, University Hospitals and MetroHealth Hospital and the Free Clinic and set in motion some important pieces: Drug Drop-off boxes in 50+ police stations, Naloxone distribution (DAWN program) run out of the MetroHealth Medical Center as well as at the Free Clinic and Board of Health, warning letters to released inmates who were at greater overdose risk due to their abstinence (while incarcerated) as well as those patients leaving treatment centers, the creation of the Heroin Death Review Committee and the Heroin Summit held at the Cleveland Clinic in November 2013. Law enforcement also created specialized task forces that work with our medico-legal death scene investigators to begin investigations earlier and our Regional Forensic Lab works to provide highly accredited, timely and efficient scientific testing. Prosecutors at the County and Federal level are now levying much stiffer charges that target dealers. All of this work continues to implement a community-wide and community-based strategy that was the result of the Summit.

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When a heroin overdose occurs, individuals typically fall asleep and breathe more and more shallowly until, at last, they stop altogether. During this progression, the dying sequence can be by the heroin antidote, naloxone, which was made more readily available in Ohio and is an immediate first step in saving lives and should be applauded. Cuyahoga County and MetroHealth Medical Center partnered in 2013 to distribute naloxone by prescription as was then allowed by Ohio law and currently have documented nearly 1000 overdose reversals. Police departments, under a pilot program started in 2014 but in earnest last year, have documented another 300 reversals. These are individuals who did not have to make a final trip to my office. The introduction of fentanyl and even more potent analogs like carfentanil, a large animal tranquilizer, have diminished the efficacy of naloxone. Several doses may now be required and the time window for administration is greatly shortened. This is a fundamental reason for the catastrophic rise in mortality in 2016.

Research conducted by the Cuyahoga County Medical Examiner's office in collaboration with medical, law enforcement and forensic partners indicates that nearly 600 people died of heroin related overdoses over three years in Cuyahoga County (2012-14) and some promising intervention points should be considered. At least 72% of all our heroin related deaths in 2012 - 2014 had been prescribed a controlled substance within two years of their death, over 50% of those for opioids. This is a significant number of people who are:

- a) Already in the health care system;
- b) Already have a physician; and
- c) Have more ready access to treatment options and other diversion and prevention measures

Also from our 2013-2014 overdose deaths, 27% were 'doctor shopping' – by definition, saw more than five (5) different doctors within one year to obtain pain medications. The now mandatory use of OARRS, Ohio's prescription drug monitoring program, by physicians prior to any pain medication prescription should help eliminate this possibility. This simple step may save hundreds of lives a year in Cuyahoga County alone.

As a final example of the valuable information we have gleaned from our detailed review of these unfortunate deaths, it is notable that many of these individuals who have died have been in contact with the legal system and/or the drug and alcohol treatment programs. There is a tremendous need for education and these are opportunities we need to maximize for messaging. It would be naïve to think that education and messaging efforts would be effective if we do not address the need for adequate treatment options once the message has been delivered. People can recover from drug addiction with appropriate support.

And while data and information are critical in helping to determine effective strategies, it has been particularly inspiring to see the sense of community urgency and responsibility that has brought together experts from prevention, treatment, law enforcement and prosecution together like never before for this single purpose - to save lives.

At this time, however, local resources have been exhausted. The Death Investigation System and local Forensic Labs are now facing double digit caseload increases annually, personnel shortages, equipment breakdown and failure and costly and complex processes to identify, catalog, standardize and confirm an ever changing menu of substances known as novel synthetic opioids – the fentanyl analogs.

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While we have interacted well and successfully with federal partners at our local level – US Attorney, DEA, FBI, HIDTA, it is clear that the supply and delivery of these drugs to our community is nearly unabated and treatment options are severely limited. Our community has added millions to the effort for the past several years. Our estimates, however, are that there are enough people in our county, dependent on opioids, to fill our football stadium every year. And that our basketball arena could be filled for the number who switch over to heroin or fentanyl, EVERY YEAR.

That used to be a largely Caucasian majority, upwards of 85% of all victims. That however is now changing. With seemingly purposeful intent, cocaine is now being mixed with fentanyl and it's analogs in an effort to introduce these drugs into the African American population. Cocaine had been the only drug that victims were predominately African American. The covert introduction of fentanyl into the cocaine supply has caused a rapid rise in fatalities and in 2017, the rate of African American fentanyl related deaths has doubled from 2016.

The strategies to combat this crisis is not a matter of innovative creation but of sheer will, cooperation and adequate resources. The will and cooperation we have in Cuyahoga County. The resources are being depleted and overwhelmed. Treatment beds need to be opened and adequately funded. Our County Executive in cooperation with the Mayor of Cleveland and our local Alcohol and Drug Board has created an additional \$1.5 million to help fund treatment. The IMD exclusion for Medicaid reimbursement must be lifted. The bill currently offered by Chairman Portman and Ohio colleague Senator Sherrod Brown will more than double the number of available beds. Interdiction agreements with China, Mexico and Canada need to be strengthened and delivery of these substances through US Postal Service or other delivery services needs to be squeezed off.

Further, there is a national crisis in death investigation. My field of specialty, forensic pathology, is in dire need. Less than 500 forensic pathologists practice in the United States. Currently, 28 different offices across the United States are seeking to hire forensic pathologists. As the oldest training program in existence, our office is one of only 35 in the country. Our program graduates 1 or 2 doctors a year in a system that only produces a few dozen new forensic pathologists annually. It is essential that additional support be given to these training programs as well as incentives for doctors to enter this field.

All of these actions are beyond the ability and authority of local counties like ours. We need your continued and renewed assistance, resources and commitment in all phases of this fight: Prevention, Education, Treatment, Enforcement and Recovery.

Thank you for your time and consideration. I am happy to answer any questions that I can.

2016

FINAL DRUG DEATHS REPORT

CUYAHOGA COUNTY MEDICAL EXAMINERS OFFICE

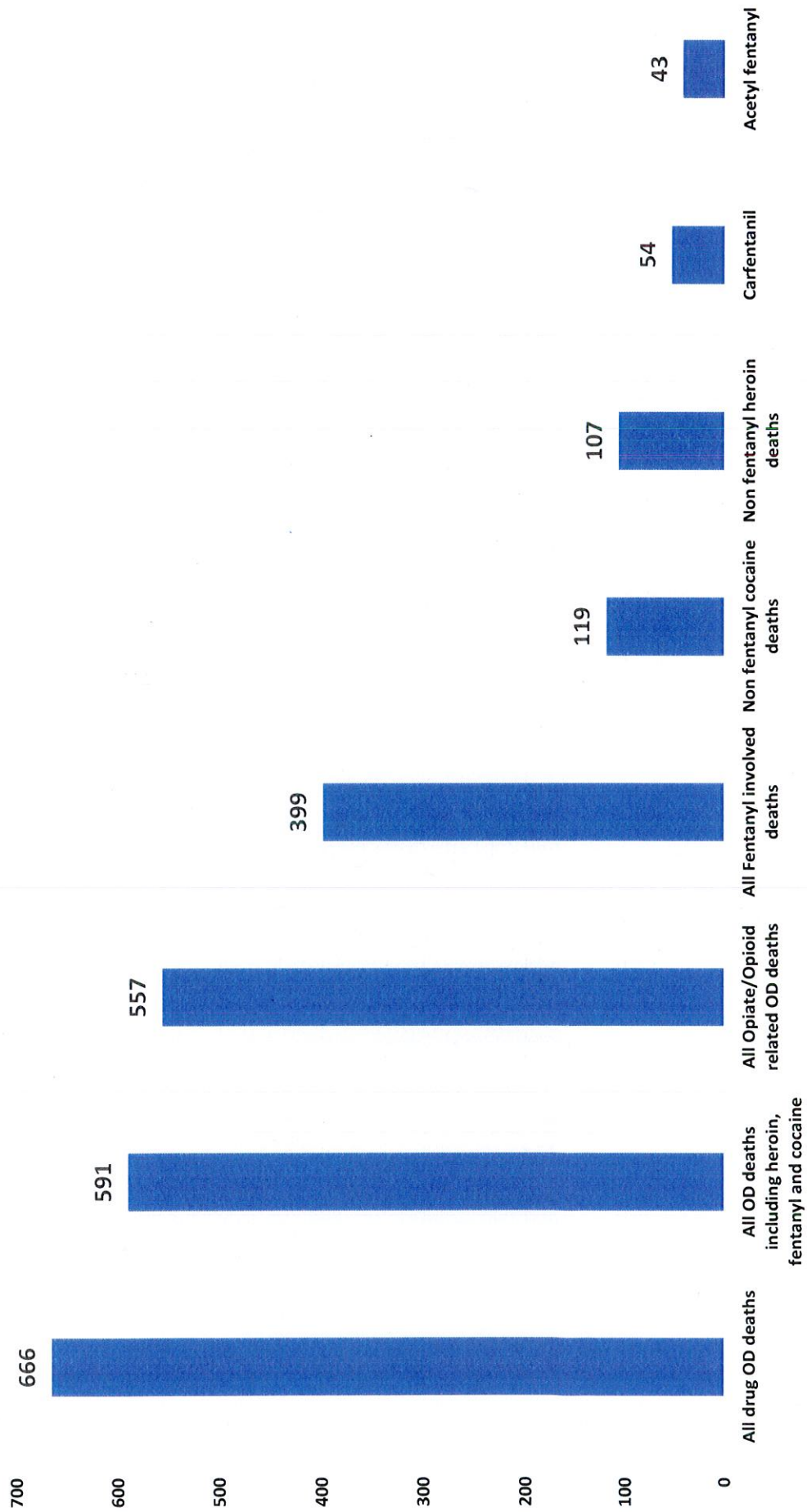
DR. THOMAS P. GILSON, MD



CUYAHOGA COUNTY, 11001 Cedar Ave., Cleveland, OH 44106

CCMEO 2016 Fentanyl involved deaths

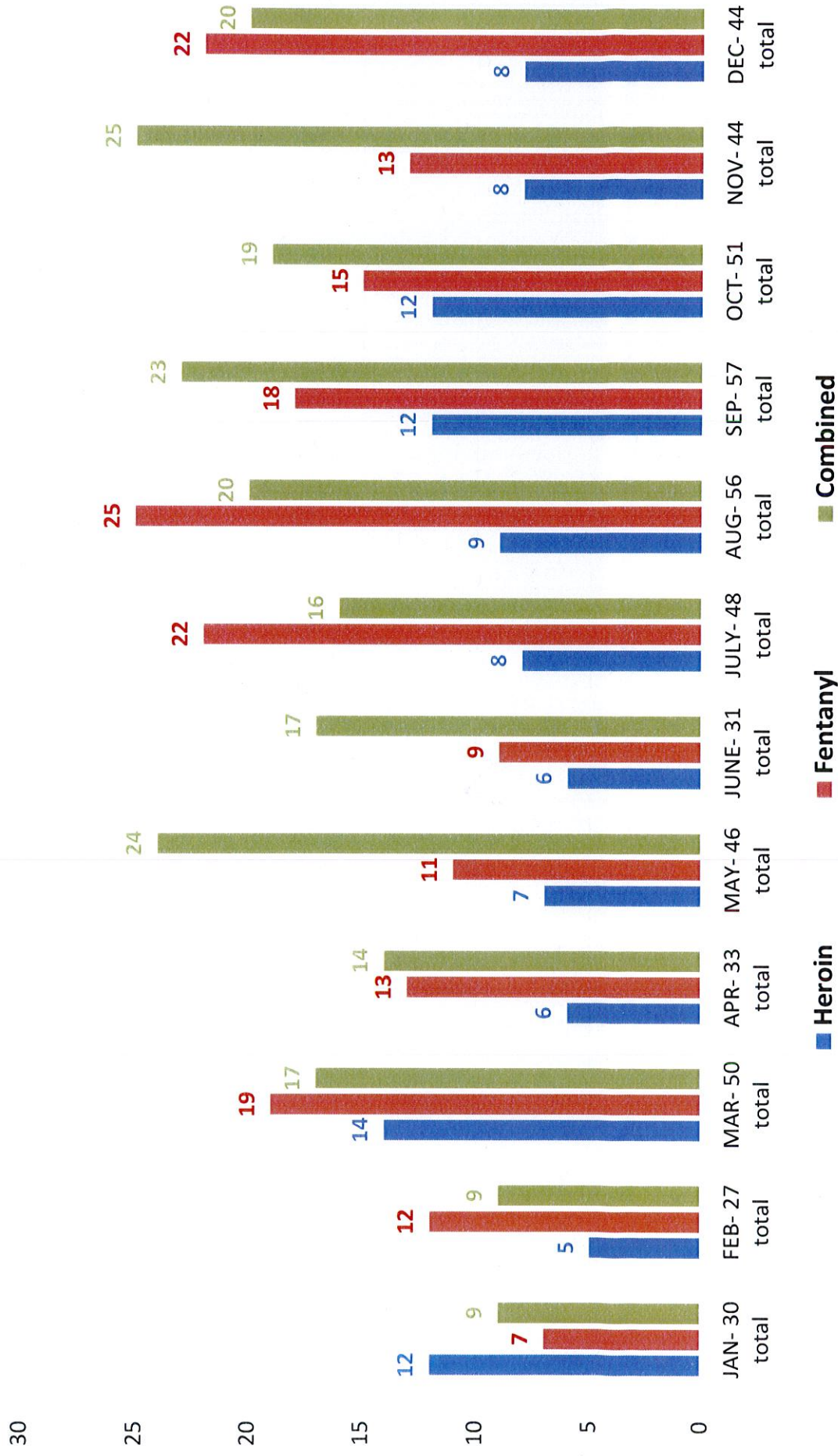
Notes: All analogues are included in total fentanyl-involved deaths and there is overlap between categories



Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



CCMEO 2016 Fentanyl & Heroin Related Deaths, by Month

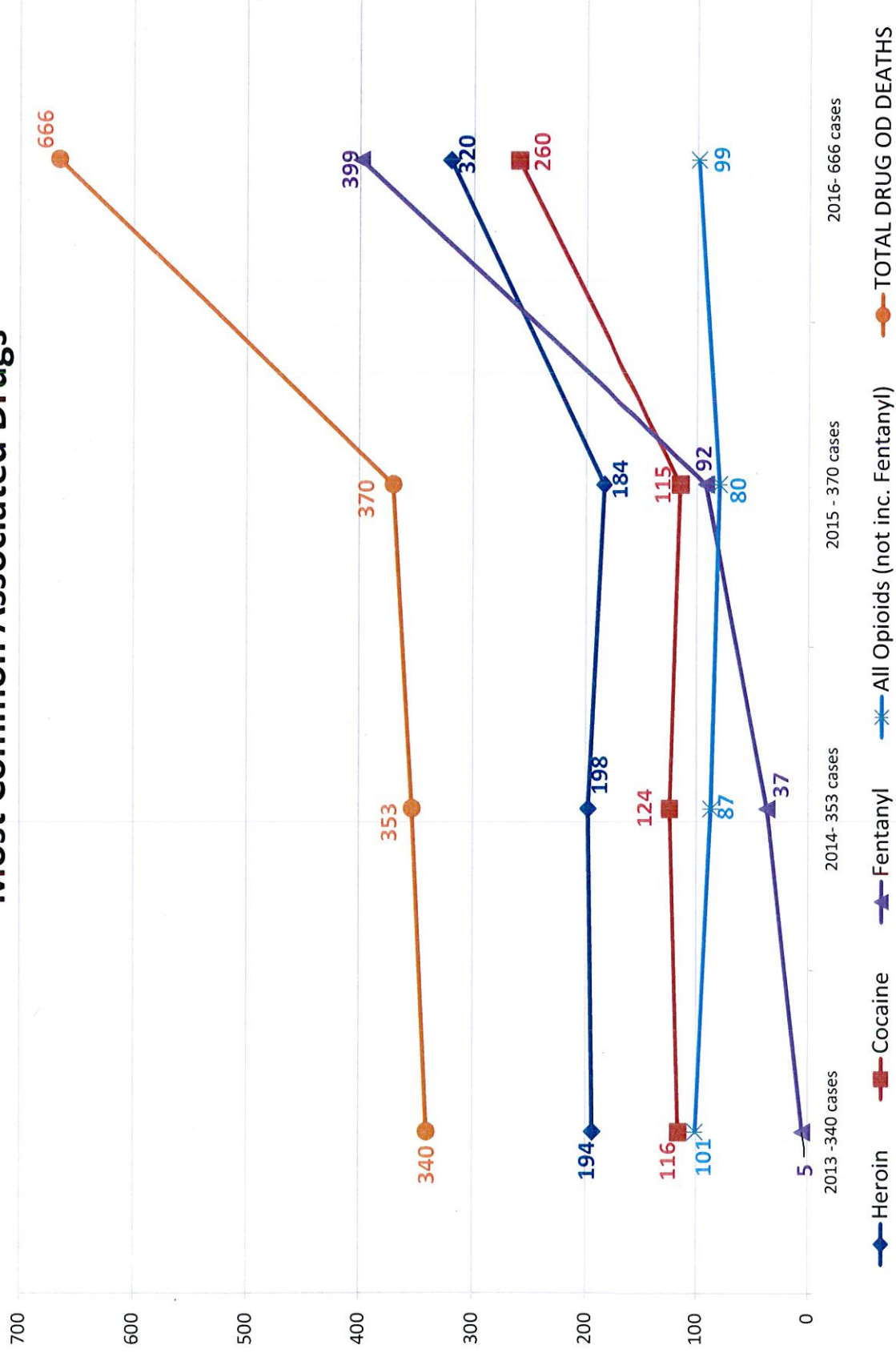


Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



Cuyahoga County Overdose Deaths 2013-2016

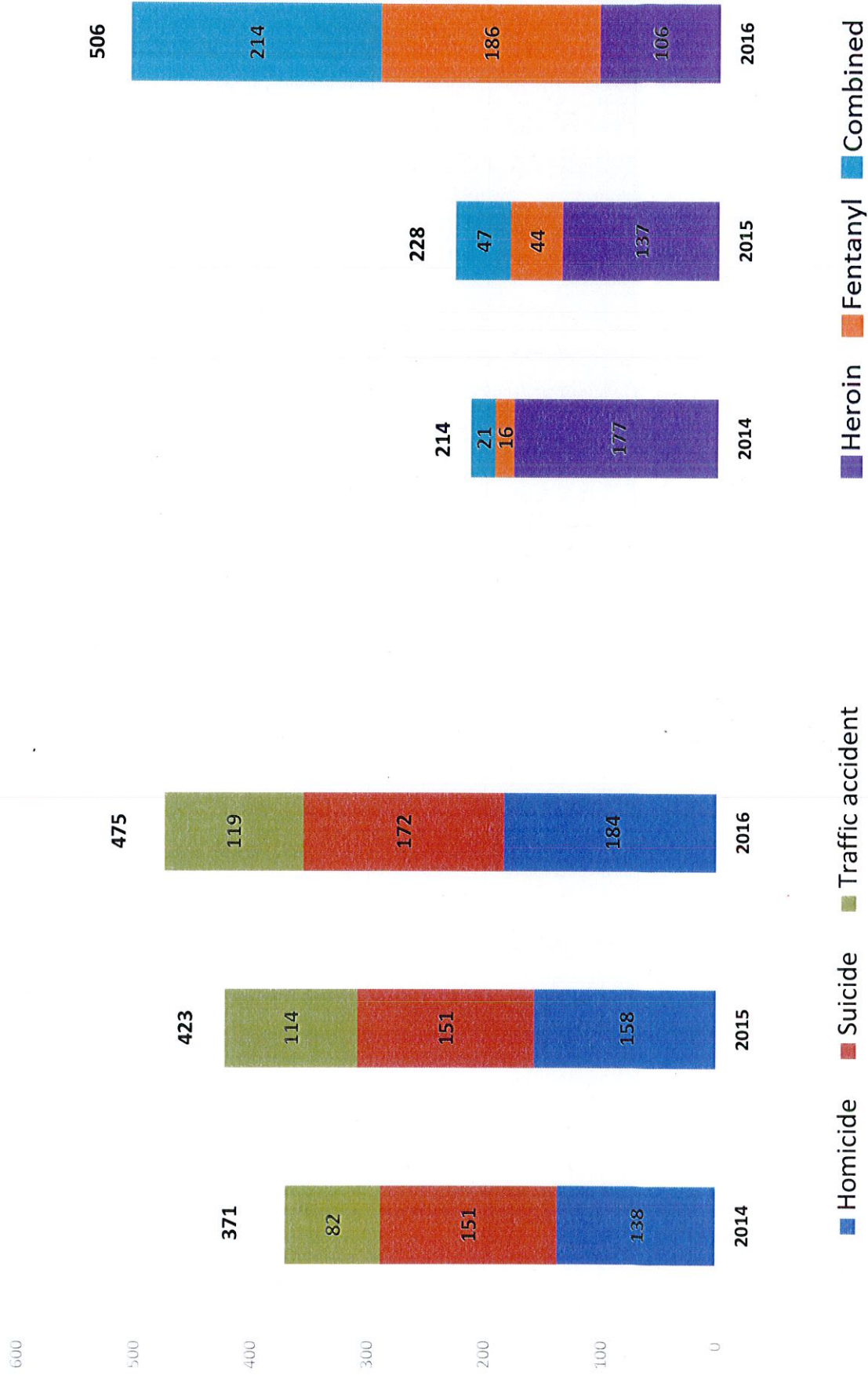
Most Common Associated Drugs



Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



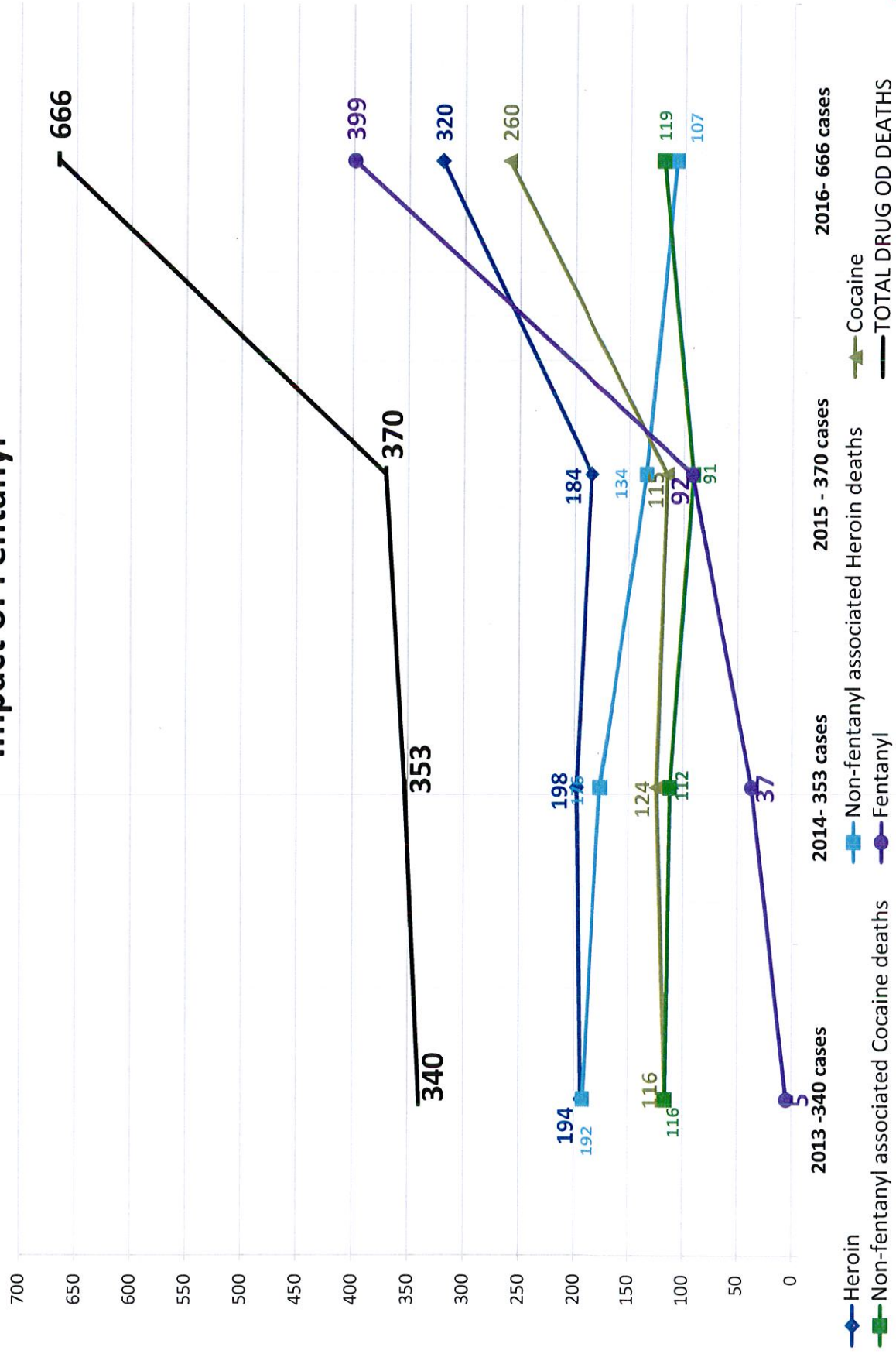
CCMEO Comparison Violent Deaths vs. Heroin/Fentanyl 2014-2016



Source: Cuyahoga County Medical Examiner's Office revised 5-25-17

Cuyahoga County Overdose Deaths 2013-2016

Impact of Fentanyl

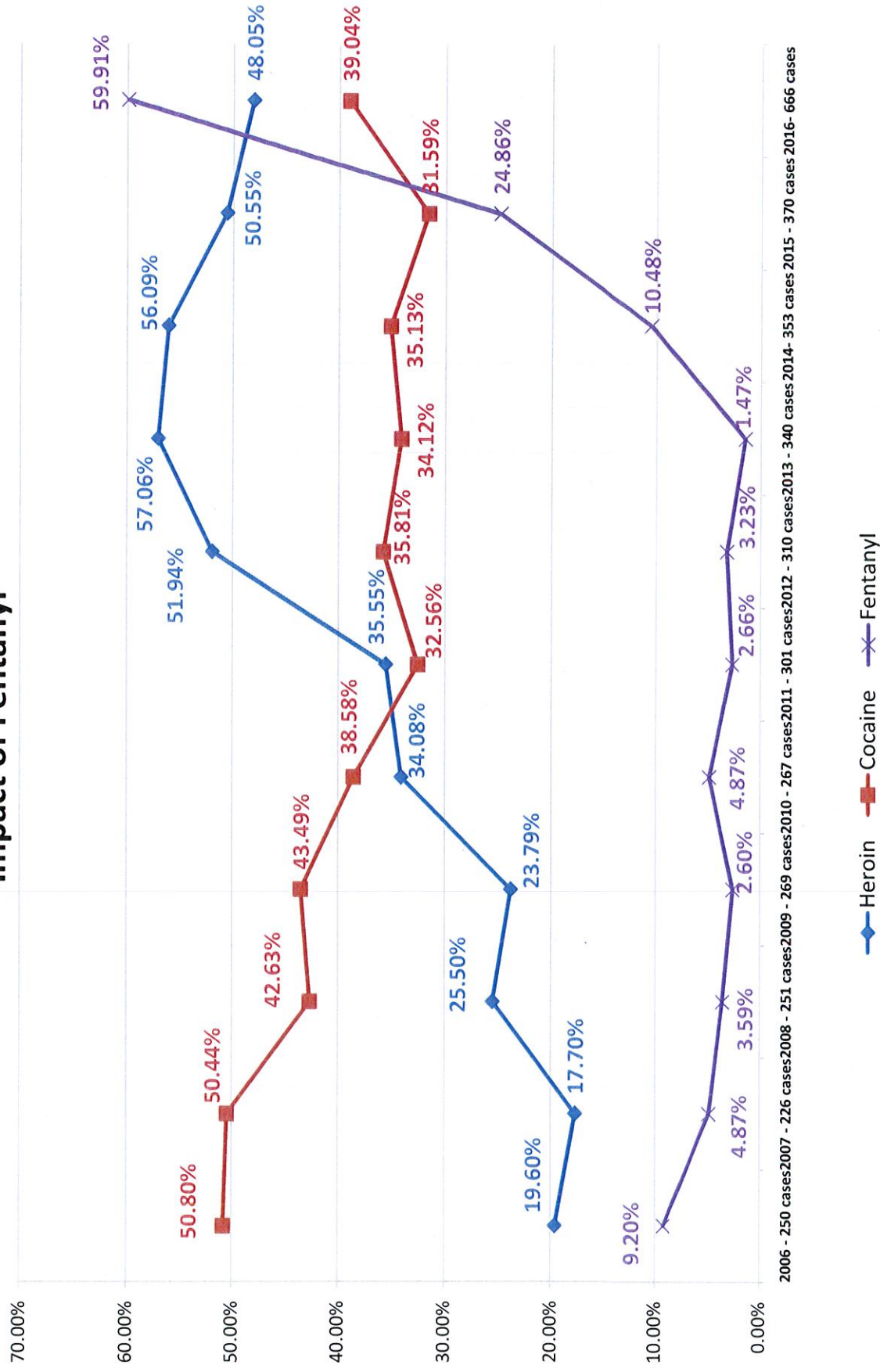


Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



Cuyahoga County Overdose Deaths 2006-2016, Drug By %

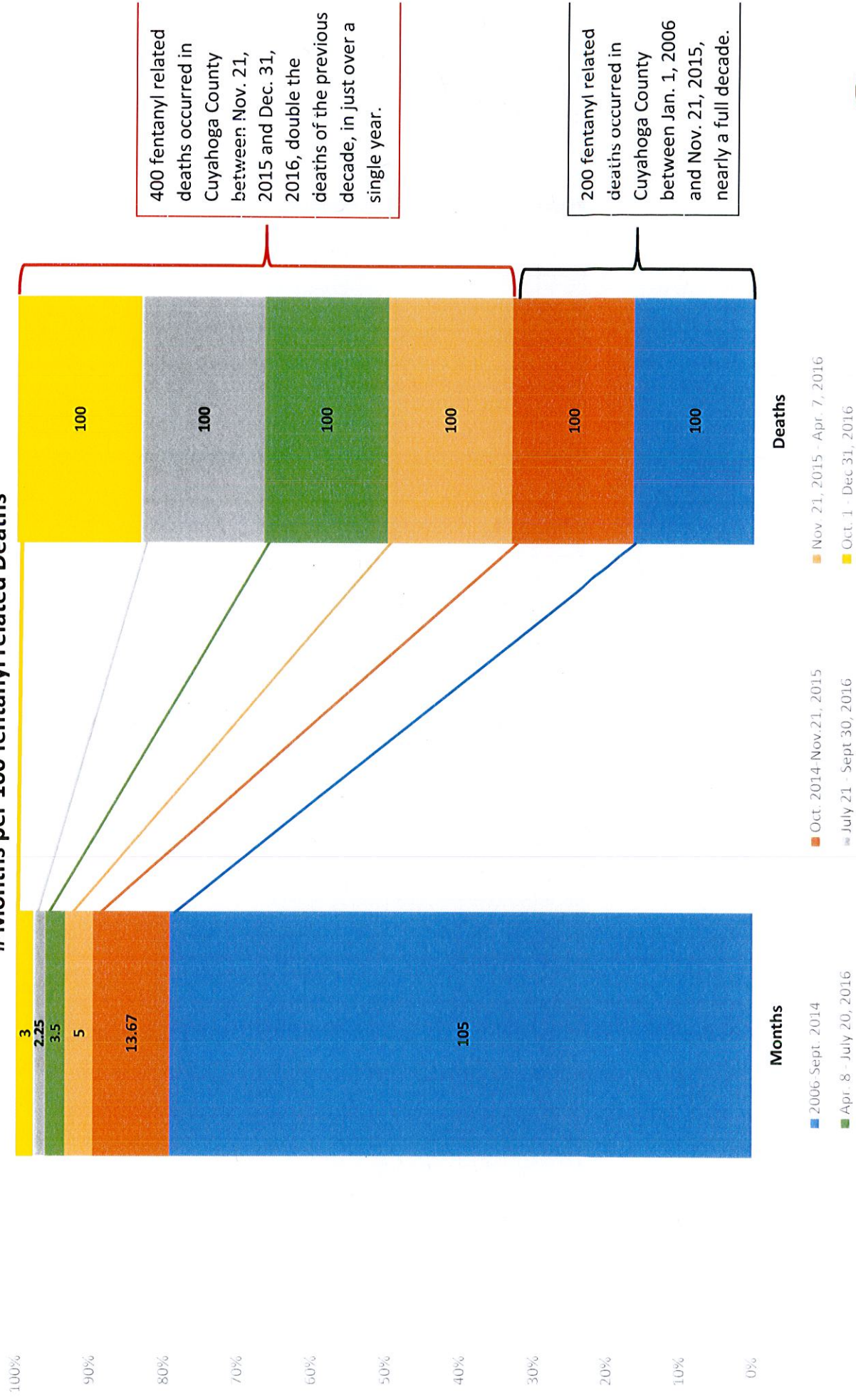
Impact of Fentanyl



Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



Cuyahoga County Fentanyl Deaths 2006-2016 # Months per 100 fentanyl related Deaths



CCMEO Overdose Deaths involving Cocaine 2006-2016

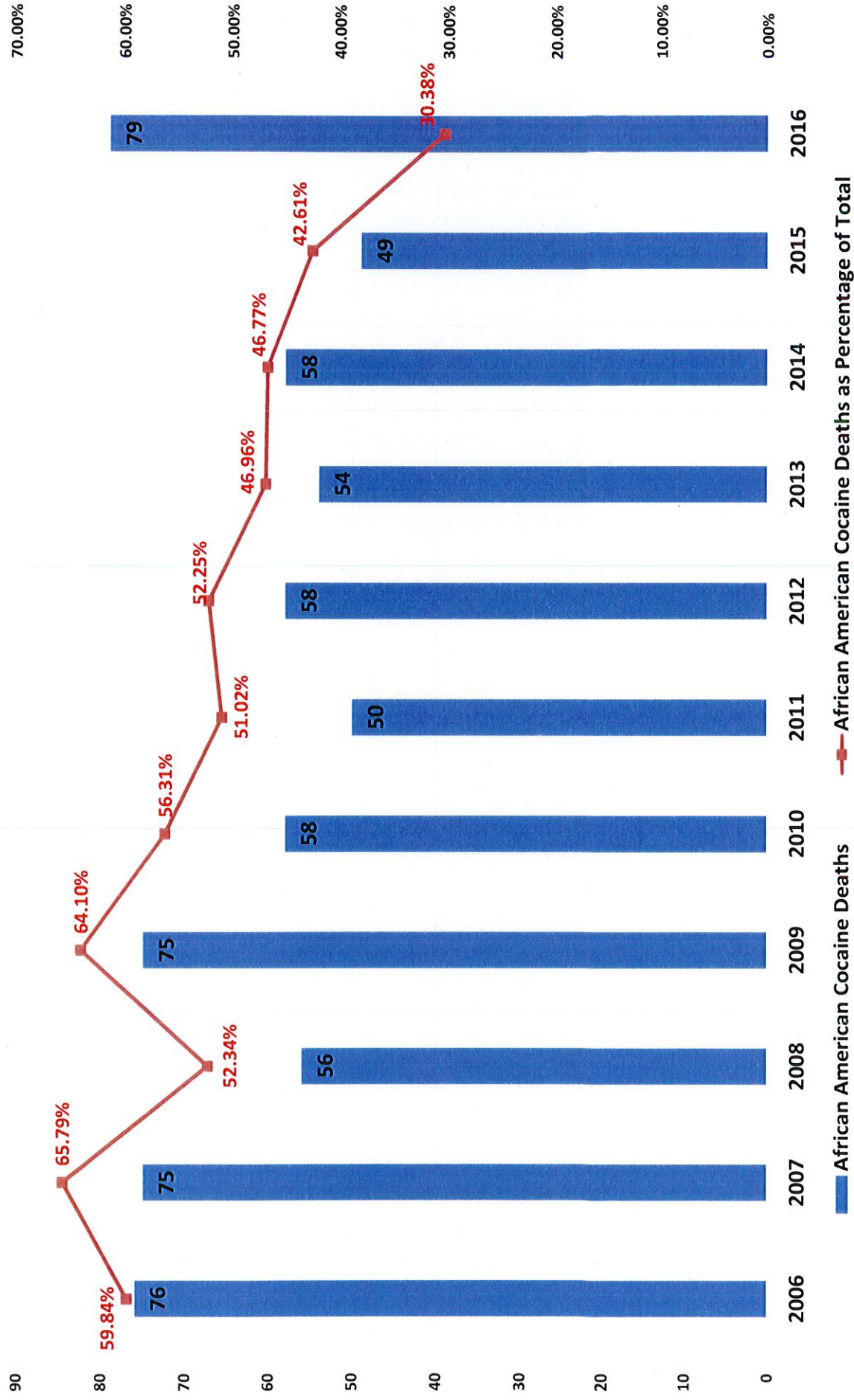
The Re-emergence of Cocaine



Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



CCMEO Cocaine related Overdose Deaths 2006-2016 Demographic Shift in Cocaine Deaths

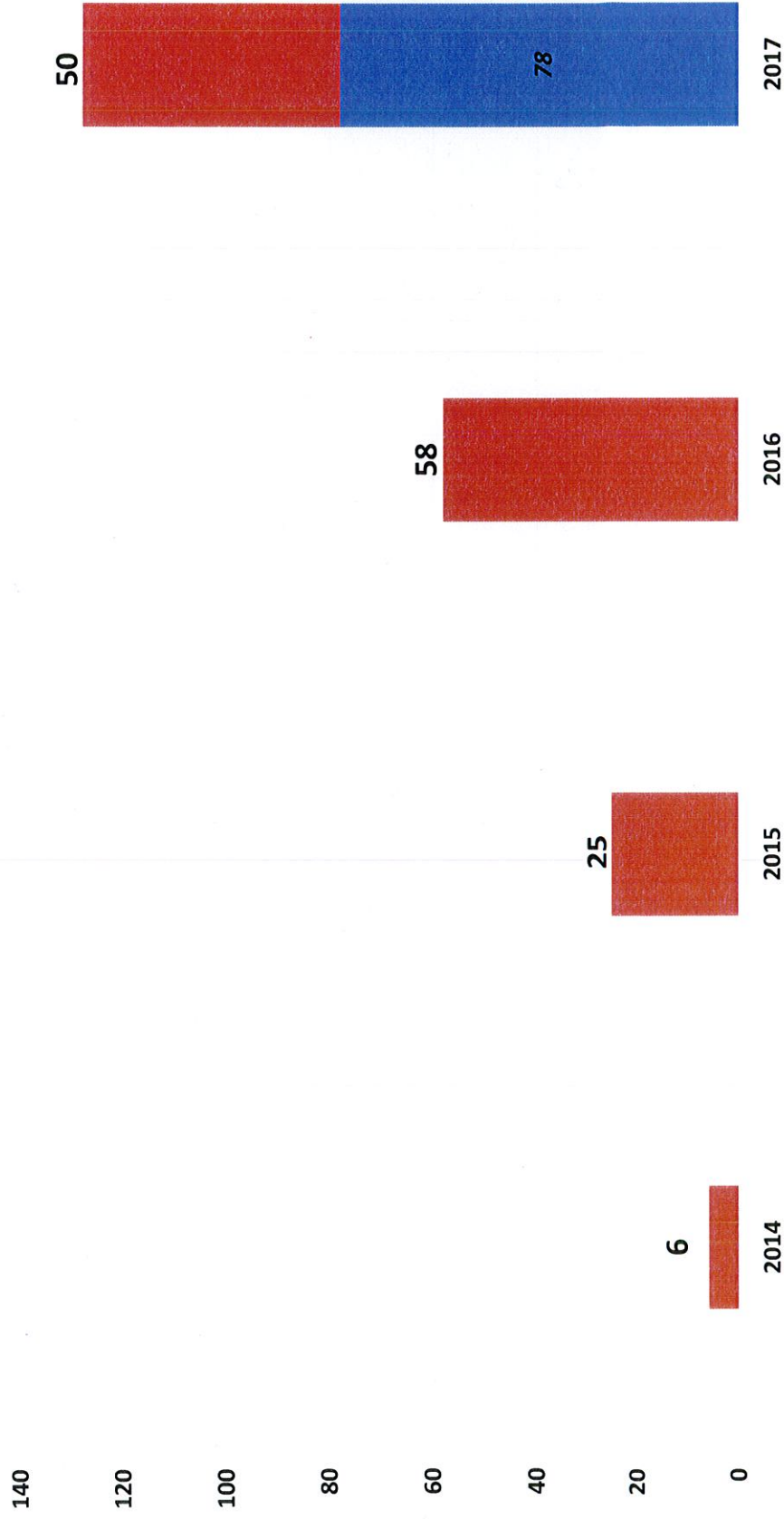


Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



CCMEO Fentanyl-related fatalities among African Americans 2014-2017*

(Blue - Projected for remainder of year as of May 9, 2017)



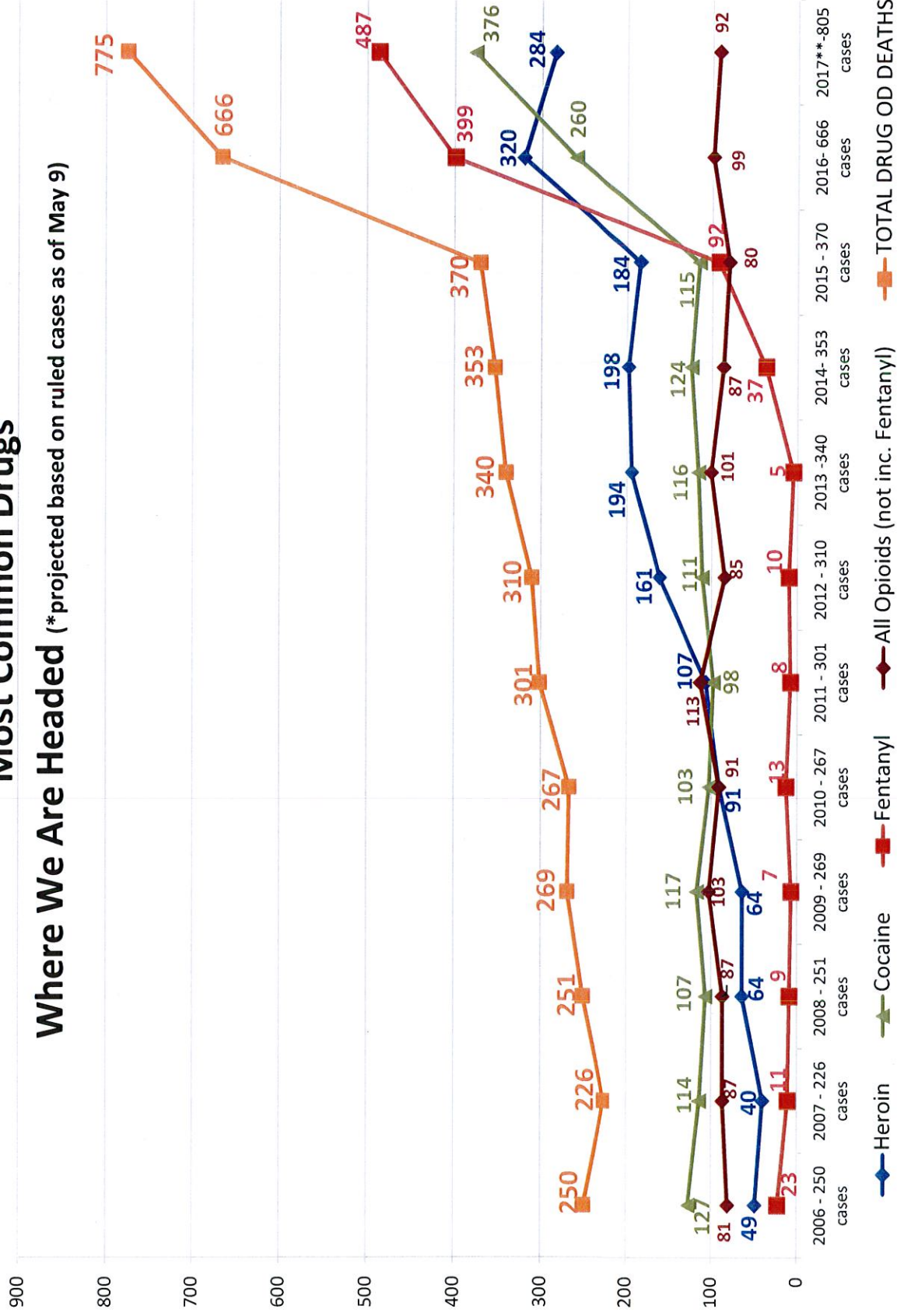
Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



Cuyahoga County Overdose Deaths 2006-2017*

Most Common Drugs

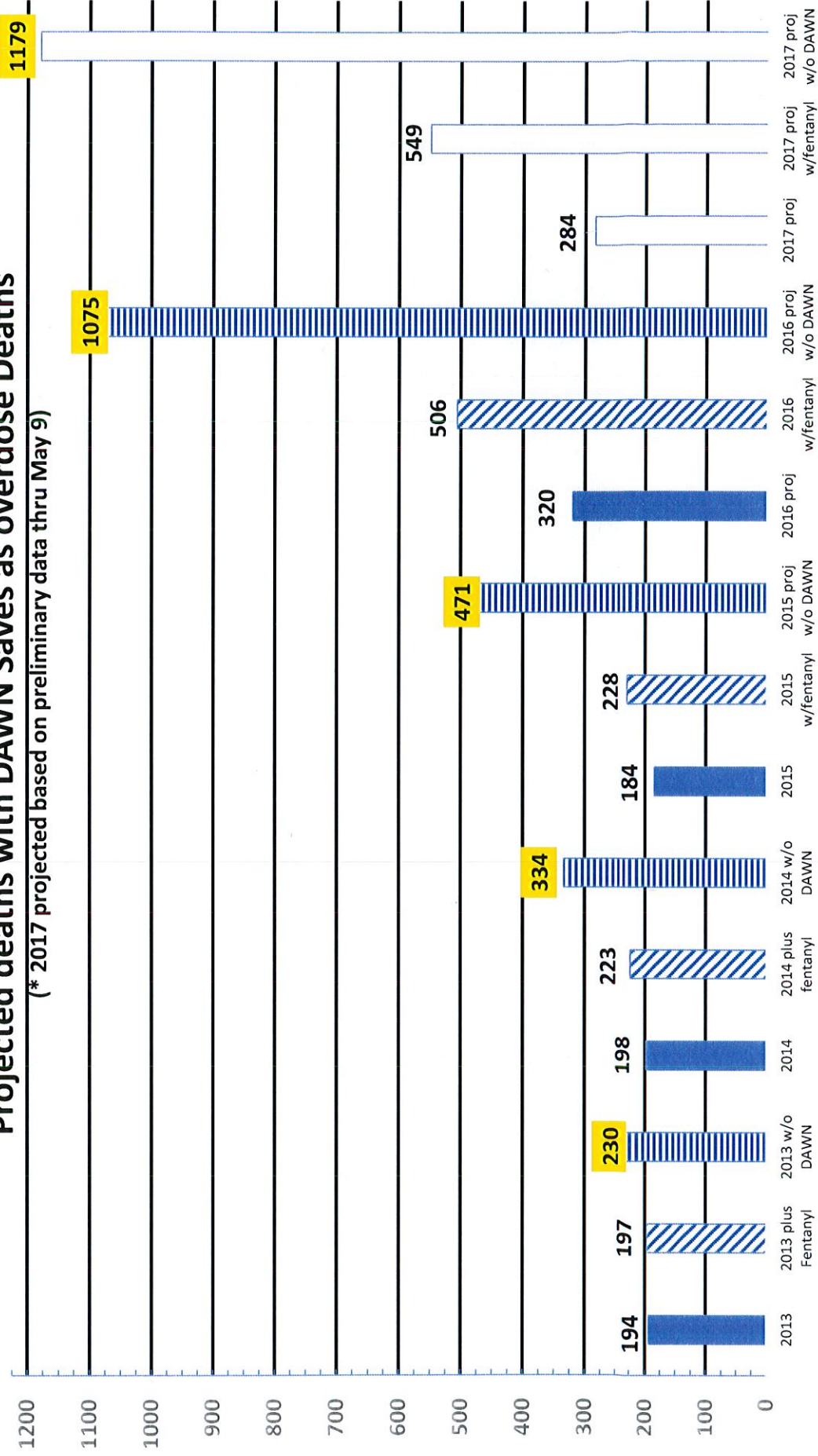
Where We Are Headed (*projected based on ruled cases as of May 9)



Cuyahoga County Heroin/Fentanyl Related Overdose Deaths 2007-2017*

Projected deaths with DAWN Saves as overdose Deaths

(* 2017 projected based on preliminary data thru May 9)



Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



[illegible]

COCAINE	Cocaine + Cocaine + Fentanyl + Fentanyl +																				
	Cocaine					Fentanyl + Fentanyl +															
	TOTAL	Cocaine	Heroin	Cocaine	Heroin	TOTAL	Cocaine	Heroin	Cocaine	Heroin											
	260	85	34	68	73																
	32.69%	13.08%	26.15%	28.08%																	
Male	184	Female	76	White	181	Black	79	Other	Res			Inc			Age						
									Hispanic	CLE	Sub	OU	CLE	Sub	OU	?	<18	19-29	30-44	45-60	60+
									4	145	82	33	141	79	5	35	5	42	77	104	32
70.77%	29.23%	69.62%	30.38%	0.00%	1.54%	55.77%	31.54%	12.69%	54.23%	30.38%	1.92%	13.46%	1.92%	16.15%	29.62%	40.00%	12.31%				

2016 DEMOGRAPHIC ANALYSIS - FENTANYL

Fentanyl +														
Fentanyl + Fentanyl + Heroin +														
Fentanyl + Fentanyl + Heroin + Cocaine														
FENTANYL	TOTAL	Fentanyl	Heroin	Cocaine	Cocaine									
399	117	141	68	73										
	29.32%	35.34%	17.04%	18.30%										
Res														
Inc														
Age														
Male	Female	White	Black	Other	Hispanic	CLE	Sub	OU	CLE	Sub	OU	?	<18	60+
292	107	341	58	0	11	177	175	160	47	182	160	11	46	32
73.18%	26.82%	85.46%	14.54%	0.00%	2.76%	44.36%	43.86%	40.10%	11.78%	45.61%	40.10%	2.76%	11.53%	8.02%
Res														
Inc														
Age														
Male	Female	White	Black	Other	Hispanic	CLE	Sub	OU	CLE	Sub	OU	?	<18	60+
93	24	100	17	0	5	44	62	51	11	50	51	5	11	10
79.49%	20.51%	85.47%	14.53%	0.00%	4.27%	37.61%	52.99%	43.59%	9.40%	42.74%	43.59%	4.27%	9.40%	8.55%
Fentanyl +														
Heroin														
101	40	128	13	0	5	54	71	65	16	57	65	3	16	9
71.63%	28.37%	90.78%	9.22%	0.00%	3.55%	38.30%	50.35%	46.10%	11.35%	40.43%	46.10%	2.13%	11.35%	6.38%
Fentanyl +														
Cocaine														
49	19	53	15	0	1	42	14	17	12	41	17	3	7	9
72.06%	27.94%	77.94%	22.06%	0.00%	1.47%	61.76%	20.59%	25.00%	17.65%	60.29%	25.00%	4.41%	10.29%	13.24%
Fentanyl +														
Heroin +														
Cocaine														
49	24	60	13	0	0	37	28	27	8	34	27	0	12	4
67.12%	32.88%	82.19%	17.81%	0.00%	0.00%	50.68%	38.36%	36.99%	10.96%	46.58%	36.99%	0.00%	16.44%	5.48%



Source: Cuyahoga County Medical
Examiner's Office revised 5-25-17

2016 DEMOGRAPHIC ANALYSIS - HEROIN

[illegible]

Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



2016 DEMOGRAPHIC ANALYSIS - COCAINE

Cocaine +

Cocaine + Fentanyl + Fentanyl +

Cocaine Heroin Cocaine Heroin

COCAINE	TOTAL	Cocaine	85	34	68	73
	260	32.69%	13.08%	26.15%	28.08%	
	Male	Female	White	Black	Other	Hispanic
	184	76	181	79	0	4
	70.77%	29.23%	69.62%	30.38%	0.00%	1.54%
	Res	Sub	CLE	OU	Sub	CLE
	55.77%	31.54%	12.69%	54.23%	30.00%	1.54%
	Inc	Sub	OU	CLE	Sub	OU
	141	33	82	141	78	4
	Age	<18	19-29	30-44	45-60	60+
	1.92%	16.15%	29.62%	40.00%	12.31%	

Cocaine + Fentanyl + Fentanyl +

Cocaine Heroin Cocaine Heroin

	Male	Female	White	Black	Other	Hispanic
	61	24	36	49	0	1
	71.76%	28.24%	42.35%	57.65%	0.00%	1.18%
	Res	Sub	CLE	OU	Sub	CLE
	58.82%	30.59%	10.59%	56.47%	23.53%	1.18%
	Inc	Sub	OU	CLE	Sub	OU
	48	9	26	48	20	1
	Age	<18	19-29	30-44	45-60	60+
	2.35%	5.88%	18.82%	54.12%	18.82%	

Cocaine + Fentanyl + Fentanyl +

Cocaine Heroin Cocaine Heroin

	Male	Female	White	Black	Other	Hispanic
	25	9	32	2	0	2
	73.53%	26.47%	94.12%	5.88%	0.00%	5.88%
	Res	Sub	CLE	OU	Sub	CLE
	47.06%	41.18%	11.76%	52.94%	41.18%	0.00%
	Inc	Sub	OU	CLE	Sub	OU
	18	4	14	18	14	0
	Age	<18	19-29	30-44	45-60	60+
	2.94%	17.65%	29.41%	41.18%	8.82%	

Fentanyl + Fentanyl + Fentanyl +

Cocaine Heroin Cocaine Heroin

	Male	Female	White	Black	Other	Hispanic
	49	19	53	15	0	1
	72.06%	27.94%	77.94%	22.06%	0.00%	1.47%
	Res	Sub	CLE	OU	Sub	CLE
	61.76%	20.59%	17.65%	60.29%	25.00%	4.41%
	Inc	Sub	OU	CLE	Sub	OU
	41	12	14	41	17	3
	Age	<18	19-29	30-44	45-60	60+
	1.47%	14.71%	41.18%	29.41%	13.24%	

Fentanyl + Fentanyl + Fentanyl +

Cocaine Heroin Cocaine Heroin

	Male	Female	White	Black	Other	Hispanic
	49	24	60	13	0	0
	67.12%	32.88%	82.19%	17.81%	0.00%	0.00%
	Res	Sub	CLE	OU	Sub	CLE
	50.68%	38.36%	10.96%	46.58%	36.99%	0.00%
	Inc	Sub	OU	CLE	Sub	OU
	34	8	28	34	27	0
	Age	<18	19-29	30-44	45-60	60+
	1.37%	28.77%	31.51%	32.88%	5.48%	

Source: Cuyahoga County Medical
Examiner's Office revised 5-25-17



AGENCY IMPACTS – AUTOPSIES (By month and doctor)

2014	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
	21.6	21.9	21.9	15.6	17.3	20.9	29	10.9	25	18.6	21	15.9	239.6
	0	0	0	0	0	0	0	6	29	29	29.3	31.6	124.9
	27.1	12	18.6	17	27.4	18.3	7.3	24.7	13.7	14.4	17.3	16.9	214.7
	24.4	33	17	20.1	12.6	25.4	27.1	17.7	19.7	14.9	13.4	19.4	244.7
	6.7	14.9	8.3	10.4	17	7.7	24.9	15.4	13.3	11	10.3	18.1	158
								27	18	21	19	22	107
	21.7	11	15.1	27.7	29.7	18.1	25.1	18.6	26.3	16	15.7	18	243
	26	25	18.3	22.3	20	2.3							113.9
	26.3	20.9	19.6	20.4	18.6	20.4	29	16	10.6	27.1	14.9	13.1	236.9
TOTAL	153.8	138.7	118.8	133.5	142.6	113.1	142.4	136.3	155.6	152	140.9	155	1682.7
2015	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
	28.3	10.3	25.3	15.1	18.4	17	33.4	23.6	18.6	28.3	22.4	14.9	255.6
	26.3	21.1	23.6	27.4	34	31.3	29.1	25.4	20	23.7	19.7	18.6	300.2
	18.9	11.4	19.3	13.7	24.3	16.1	19.1	22.7	19.6	8.1	18.4	25.3	216.9
	26.4	24.1	20.7	10.9	25	31	22.3	28.6	22.3	27.4	20.7	18.7	278.1
	12.1	8.6	13.9	19.9	10.4	17.9	9.6	5	15.7	12.9	9	24.4	159.4
							17	23	20	22	21	20	123
	24	20	21	26.1	22.6	17.7	0.9						132.3
							25	23	14	19	21	24	126
	16.7	22.6	18.4	26.1	19.3	28.4	18.4	19.4	25.6	25	24	11.3	255.2
	22.4	20.9	12.7	11.3									67.3
TOTAL	175.1	139	154.9	150.5	154	159.4	174.8	170.7	155.8	166.4	156.2	157.2	1914
2016	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
	23.4	11	26.6	18.9	22.7	35.1	33.9	32	28.1	29.7	35.3	29.1	325.8
							23	27	22	31	21	26	150
	22.4	26.3	22.1	20.6	32.3	31.3	27.4	37.9	26.1	29	23.7	36	335.1
	26.4	8	22.9	14.9	37.6	25.4	0	37.6	20.1	18.9	22.7	18.3	252.8
	16.1	29	29.3	19	9.3	38.1	40.6	39.6	33.4	30.7	32.9	19.4	337.4
	9.3	11.3	12.9	17.1	24	11.6	29.1	21.4	13	25	15.4	37	227.1
	26	26	32.3	29.4	15.6	0	0	0	0	0	0	0	129.3
	24.4	29.9	28.9	22.7	22.1	0.9	0	0	0	0	0	0	128.9
	17	26.3	16.3	17.9	28.3	31.9	34.3	25	36.3	31.4	31.6	22	318.3
TOTAL	165	167.8	191.3	160.5	191.9	174.3	188.3	220.5	179	195.7	182.6	187.8	2204.7

Note: 2016 caseload increased 16.196%

Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



AGENCY IMPACTS - DRUG CHEMISTRY

MEDICAL EXAMINER / CCFRSL

Drug Chemistry 2016	JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Submissions	424	483	495	524	562	493	299	514	570	502	476	431	5773
Submissions Completed	420	400	546	397	687	494	303	518	441	595	469	414	5684
Completed from Previous Month/s	83	92	166	93	228	116	109	111	77	205	107	124	1511
Submissions Pending (Backlog)	69	69	66	220	110	57	112	119	158	119	115	106	1320
10 day Completion (%)	95.7	95.5	84.4	85.8	74.2	91.8	75.2	82.2	91.6	80.6	89.3	88.4	86.23
5 day Completion (%)	83.1	70.5	69.9	69	56.9	80	72.6	74.7	82.7	70.5	71.6	78.9	73.37
Average TAT	3.6	3.9	5.9	5.9	8	7.5	7.2	5.1	4.3	7.4	5.9	6.6	5.94
Items Processed	1412	665	1321	1056	1438	1176	988	1289	1085	1623	1228	1296	14577

MEDICAL EXAMINER / CCFRSL

2015

Drug Chemistry	JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Submissions	436	377	489	495	373	392	400	396	467	475	415	425	5140
Submissions Completed	450	366	501	462	400	400	372	400	393	419	344	618	5125
Completed from Previous Month/s	53	42	52	38	69	46	39	67	63	137	193	273	1072
Submissions Pending (Backlog)	23	31	3	58	34	3	0	0	71	93	214	27	557
10 day Completion (%)	97	93	94	97	95	97	80	98	94	81	65	71	1063
5 day Completion (%)	82	79	87	89	85	88	36	93	69	48	43	41	840.2
Average TAT	3	4	3	3	3	3	5	3	5	6	7	9	53.9
Items Processed	863	655	968	1063	931	946	825	884	680	1164	769	1124	10872

Note: 2016 caseload increased 10.96% & items processed in those cases has increased by 34.07%.

MEDICAL EXAMINER / CCFRSL

2014

Drug Chemistry	JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Cases Submitted	487	489	555	600	590	578	585	609	636	548	344	478	6499
Cases Completed	436	488	593	616	577	539	639	549	503	666	453	451	6510
Cases Pending (Backlog)	71	74	0	5	6	29	11	93	188	32	21	31	
10 day Completion (%)	98	98	98	99	98	98	98	96	73	36	83	90	88.75
5 day Completion (%)	90	82	92	96	92	92	88	72	40	6	46	70	72.17
Average TAT	2.4	3.4	2.5	1.9	2.3	2.3	2.9	5.5	7.5	12.9	6.1	4	4.48
Items Processed	857	1135	1282	1485	1008	800	1334	1014	882	1270	975	941	12983

Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



AGENCY IMPACTS - TOXICOLOGY

MEDICAL EXAMINER / CCFRSL		2016												
Toxicology		JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Cases Submitted		291	292	308	260	292	289	289	349	305	313	304	273	3565
Cases Completed		329	260	257	246	337	271	268	348	296	275	265	261	3413
Cases Pending (Backlog)		258	300	357	378	337	358	383	388	398	448	493	511	
Avg TAT (Days) - ALL		32	31	34	37	38	34	40	41	35	43	45	43	37.75
90% Completion (Days)		59	55	55	57	60	59	59	59	59	59	59	64	58.67
Avg TAT (Days) - POS		51	44	46	49	47	48	50	51	45	54	57	56	49.83
Avg TAT (Days) - NEG		7	4	7	8	12	6	10	12	7	7	12	15	8.917
MEDICAL EXAMINER / CCFRSL		2015												
Toxicology		JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Cases Submitted		292	255	249	279	280	270	282	292	272	276	278	258	3283
Cases Completed		289	271	222	362	255	269	249	324	355	301	280	310	3487
Cases Pending (Backlog)		302	328	280	317	395	367	441	434	366	344	350	308	
Avg TAT (Days) - ALL		27	42	23	39	45	59	35	50	52	41	35	41	40.75
90% Completion (Days)		58	86	58	104	118	113	82	102	90	76	62	65	84.5
Avg TAT (Days) - POS		45	61	46	57	65	65	56	68	63	56	55	56	57.75
Avg TAT (Days) - NEG		9	8	9	8	12	28	11	17	10	8	8	9	11.417

MEDICAL EXAMINER / CCFRSL		2015												
Toxicology		JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Cases Submitted		292	255	249	279	280	270	282	292	272	276	278	258	3283
Cases Completed		289	271	222	362	255	269	249	324	355	301	280	310	3487
Cases Pending (Backlog)		302	328	280	317	395	367	441	434	366	344	350	308	
Avg TAT (Days) - ALL		27	42	23	39	45	59	35	50	52	41	35	41	40.75
90% Completion (Days)		58	86	58	104	118	113	82	102	90	76	62	65	84.5
Avg TAT (Days) - POS		45	61	46	57	65	65	56	68	63	56	55	56	57.75
Avg TAT (Days) - NEG		9	8	9	8	12	28	11	17	10	8	8	9	11.417

Note: 2016 Caseload increased 8.6%

MEDICAL EXAMINER / CCFRSL		2014												
Toxicology		JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Cases Submitted		256	241	238	260	253	229	255	232	273	246	223	319	3025
Cases Completed		303	221	363	288	199	232	212	219	382	308	338	258	3323
Cases Pending (Backlog)		281	311	201	195	260	273	316	344	259	239	161	273	
Avg TAT (Days) - ALL		35	42	36	31	33	35	38	50	48	41	29	29	37
90% Completion (Days)		58	63	58	57	51	63	70	89	78	74	50	58	66
Avg TAT (Days) - POS		45	54	53	40	42	49	52	70	59	48	39	39	49
Avg TAT (Days) - NEG		19	15	12	7	8	16	14	13	14	10	8	7	12

Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



AGENCY IMPACTS - HOMICIDES

Statistics & Records	JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Homicides 2016													
City of Cleveland	10	6	6	9	10	8	14	15	15	19	17	15	144
Suburban Cuyahoga County	1	6	4	3	3	1	1	4	1	6	2	0	32
Out of County	0	0	0	1	0	0	1	0	1	0	0	0	3
Unknown	1	1	1	0	0	1	0	0	0	1	0	1	6
TOTAL	12	13	11	13	13	10	16	19	17	26	19	16	185

MEDICAL EXAMINER / CCFRSL 2015

Statistics & Records	JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Homicides													
City of Cleveland	5	8	9	10	8	14	18	12	21	13	8	3	129
Suburban Cuyahoga County	5	4	2	3	0	1	2	0	0	2	3	3	25
Out of County	0	1	0	1	1	0	0	0	0	1	1	0	5
Unknown	0	0	0	0	0	0	0	0	0	0	1	0	1
TOTAL	10	13	11	14	9	15	20	12	21	16	13	6	160

Note: Represents increase of 25 homicides (+15 in Cleveland, +7 in suburbs and -2 Out of County, +5 unknown incident origin) in 2016

2014													
City of Cleveland	8	8	6	8	14	9	6	5	12	12	15	5	108
Suburban Cuyahoga County	3	1	3	3	0	4	1	0	1	4	0	2	22
Out of County	1	1	0	0	0	0	0	1	0	0	0	1	4
Unknown	0	0	0	1	1	0	1	0	0	0	0	1	4
TOTAL	12	10	9	12	15	13	8	6	13	16	15	9	138

Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



WHAT WE KNOW

Fentanyl Substances	Date 1st Encountered
Acetyl fentanyl	2/10/16
Furanyl fentanyl	3/7/16
Butyryl fentanyl	3/23/16
Beta-Hydroxythiofentanyl	3/23/16
U-47700	5/9/16
4-ANPP	8/2/16
Para-Fluorofentanyl	8/29/16
Meta-Fluorofentanyl	8/29/16
Carfentanil	September 2016
Valeryl Fentanyl	10/25/16
Acryl fentanyl	11/7/16
para-Chloroisobutyryl Fentanyl	11/7/16
para-Fluorobutyryl Fentanyl	1/17/17
ortho-Fluorobutyryl Fentanyl	1/17/17
meta- Fluorobutyryl Fentanyl	1/17/17
Isobutyryl Fentanyl	2/16/17
Fluoroisobutyryl Fentanyl	2/16/17
Methoxyacetylfentanyl	4/19/17

Source: Cuyahoga County Medical Examiner's Office revised 5-25-17

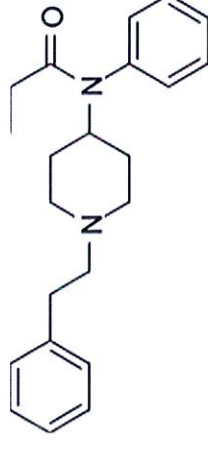


Figure 1 Fentanyl molecule

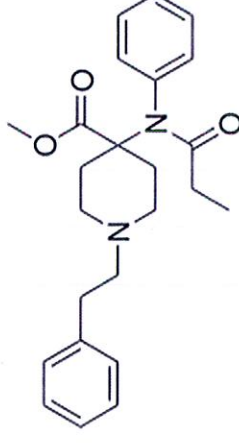


Figure 2 Carfentanil molecule

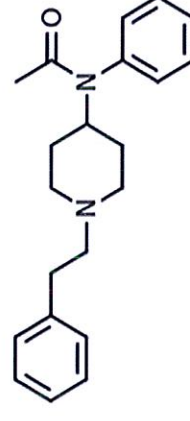


Figure 3 Acetyl fentanyl molecule

Comparison of Heroin Overdose		2012	2013	2014
Deaths: Cuyahoga County, OH		Overall Deaths, N=160	Overall Deaths, N= 194	Overall Deaths, N=198
INCIDENT INFORMATION, n(%)				
Using drugs with others		19 (11.9%)	23 (11.9%)	15 (7.8%)
Others present but not using		94 (58.8%)	113 (58.3%)	127 (64.1%)
EMS response		152 (95.0%)	191 (98.5%)	188 (95.0%)
Naloxone administered		36 (22.5%)	54 (27.8%)	59 (29.8%)
Paraphernalia present		81 (50.6%)	103 (53.1%)	99 (50.0%)
BACKGROUND INFORMATION, (%)				
Previous illicit drug use		129 (80.6%)	185 (95.4%)	158 (79.8%)
Intravenous drug use		78 (48.8%)	120 (61.9%)	63 (31.8%)
Period of abstinence		46 (28.8%)	60 (30.9%)	33 (16.7%)
Veteran		---	23 (11.9%)	5 (2.5%)
Level of Education		---	---	HS 99 (50%) None 47(23.7%) Some40(20.2%)

Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



Comparison of Heroin Overdose		2012	2013	2014
Deaths: Cuyahoga County, OH		Overall Deaths, N=160	Overall Deaths, N= 194	Overall Deaths, N=198
Previous medical treatment		75 (46.9%)	125 (64.4%)	62 (31.3%)
Previous mental health history		---	88 (45.4%)	94 (47.5%)
Previous detoxification treatment		49 (30.6%)	93 (47.9%)	59 (29.8%)
Previous incarcerations		29 (18.1%)	78 (40.2%)	44 (22.2%)
Previous arrests		32 (20.0%)	83 (42.8%)	46 (23.2%)
Previous other legal contact (parole)		23 (14.4%)	73 (37.6%)	29 (14.7%)
Enrolled in Drug Court		---	6 (3.1%)	2 (1.0%)
OARRS report on file		---	141 (72.7%)	143 (72.2%)
History of doctor shopping		---	51 (36.2%)	26 (22.2%)
Pharmacy shopping (new)		---	---	16 (13.8%)
RECOMMENDATIONS, n(%)				
Education		97 (60.6%)	145 (74.7%)	126 (63.6%)
Project DAWN		96 (60.0%)	120 (61.9%)	113 (57.1%)
OARRS		---	51 (26.3%)	31 (15.7%)

Source: Cuyahoga County Medical Examiner's Office revised 5-25-17



CUYAHOGA COUNTY HEROIN PLANNING TIMELINE

2011

December 2011

Internally began assembling data for heroin related overdose deaths

2012

January 2012

Plain Dealer reporter Donna Miller requests data for heroin related overdose deaths

January 13, 2012 – Medical Examiner's Office officially states a "statistically significant upward trend" in heroin related deaths.

CCMEO contacts ADAMHS Director William Denihan, Board of Health and Craig Tame at US Attorneys Office.

February 2012

CCMEO issues first community specific report on heroin related deaths to Garfield Hts. Police

March 2012

CCMEO toxicologist Claire Naso issues abstract for first "academic" look at heroin problem in Cuyahoga County.

CCMEO develops presentation on heroin research for use for Police Chiefs briefing

March 21, 2012 - CCMEO issues first statistical report on heroin deaths
First article in Plain Dealer appears

Maps created 2009-2011 cases, identified growing trend in women and suburban use

Begin coordination with Board of Health Opiate Taskforce

July 2012

Begin first cross-check of heroin deaths and jail records

August 2012

Begin to get first indications of data from other parts of the U.S. Numbers indicate Cleveland/Cuyahoga ranks quite high especially for population size.

Pre-planning meeting for Heroin taskforce; Inclusion of Sheriff and Cleveland Police

September 2012

Begin collection of taskforce interventions in other communities

Naloxone distribution, Poison Death Review targeted as strategies

Heroin taskforce planning meeting hosted

September 26, 2012 – County Executive Press Conference- Heroin initiative announced
Naloxone distribution w/Metro announced
Drug drop box w/ Sheriff
2012 Mid-Year statistical report
CCMEO led PDR committee
At risk target populations – Young people, justice system, treatment

October 2012

State ODADAS given CCMEO reports and briefed
County Council provided briefing presentation by Medical Examiner

October 2012 – January 2013

2012 heroin case file preparation for review

2013

February 2013

February 26, 2013 - First formal meeting of Poison Death Review Committee

Toxicology presents at AAFS ***"In Vitro Formation of Acetylmorphine from Morphine and Aspirin in Gastric Contents and Water"***

March 2013

2012 Heroin Overdose final stats released by CCMEO

HIDI protocol development begins with CCSO, CPD and CCPO; HEAT alerts begin

Project DAWN begins distribution of naloxone

First CCMEO heroin bulletin (13-156) produced and distributed through Fusion Center

April 2013

PDR 2012 report issued

Medical Examiner sends Prevention Letter to County Jail for inmates returning home

November 2013

2013 Mid-Year PDR report issued

November 18, 2013 – CCMEO issues statement regarding 6 deaths over a single weekend due to suspected heroin overdoses.

November 21, 2013 - Heroin Summit held at Cleveland Clinic

Preliminary HIDI protocols completed; training begins

December 2013

CCMEO releases second heroin bulletin

2014

January 2014

Medical Examiner sends Prevention Letter to treatment centers for patients returning home.

OARRS data now made available to Medical Examiners and Coroners.

February 2014

Dr. Gilson testifies at Joint Ohio House & Senate Health Committee on Opiate Crisis in favor of HB170 for wider distribution of Naloxone.

March 2014

Fentanyl outbreak kills 3; expedited HIDI protocols implemented; March 11, 2014 HB 170 passes and goes into effect.

April 2014

Final HIDI protocols issued to local law enforcement; suburban trainings begin

July 2014

2013 Final PDR report issued

November 2014

Heroin Initiative One Year Report to Community released

A second fentanyl outbreak kills 12 in three weeks; final numbers will double from previous year

2015

January 2015

Steady fentanyl involved deaths continue throughout 2015.

November 2015

CDC Strike-team does on ground surveillance visit of Opiate crisis. Issues report in mid-2016.

December 2015

Heroin deaths actually decrease but rise of fentanyl deaths far outpace the reduction

2016

January 2016

Fentanyl now occurs in massive numbers of overdose deaths through 2016.

March 2016

2014 PDR report released

April 2016

Taskforce members meet with County Executive and Governors Opiate Taskforce regarding Opiate crisis.

October 2016

Taskforce members meet with US Surgeon General regarding Opiate crisis.

December 2016

Ends deadliest year ever in Cuyahoga County. Heroin/Fentanyl deaths outnumber traffic accidents, homicides and suicides combined.

2017

January 2017

Rise in cocaine mixtures with fentanyl now occur regularly, doubling the rate of African American deaths due to fentanyl in first quarter of 2017.



CUYAHOGA COUNTY
MEDICAL EXAMINER'S OFFICE

Thomas P. Gilson, M.D.
11001 Cedar Avenue
Cleveland, Ohio 44106

A National Association of Medical Examiner's (N.A.M.E.) accredited office.



MEMORANDUM

TO: Thomas P. Gilson, MD
Medical Examiner

FROM: Hugh B. Shannon, Administrator

DATE: May 9, 2017

RE: Cost of Heroin/Fentanyl Crisis, Fiscal Impacts to CCMEO Operations Update

INTRODUCTION

Several months ago, an outline of additional expenditures and anticipated future costs was produced to track the impacts on CCMEO operations by the current public health crisis of heroin and fentanyl related deaths. In that memo, indicated rising caseloads across the spectrum of CCMEO and the Forensic Science Lab of 10-20% in 2015 and 2016 and a projection for similar caseloads in 2017 would produce an additional \$1.219 M in actual and anticipated costs from 2015 through 2017.

2016 final caseloads and costs were dramatically higher than 2015. Current projections of 2017 are even higher. Caseloads for most units are up 25-50% from 2016. Cases from inside Cuyahoga County have increased 42%, while cases from outside of Cuyahoga County have more than doubled in the first quarter of 2017 as compared to 2016. This would amount to a projected 2900 IN cases and 375 OU cases, up from 2595 and 317 respectively. This constitutes another 300+ cases, the equivalent to another full-time forensic pathologists caseload.

This is causing a further review and revision of the cost anticipation memo of October 4, 2016 as follows:

PERSONNEL

2 toxicologists (hired 2015)

\$100,000 + fringes

2015-16 COST COMMITMENTS

\$100,000

Forensic Pathologist (hired 2017)

\$175,000 + fringes

Contract Pathologists

\$155,000

DNA Tech upgrade to analyst

\$ 10,000

DNA Tech replacement

\$ 45,000 + fringes

Contract Toxicologist

\$ 30,000

Anticipated 2017 Cost Commitments

\$415,000

EQUIPMENT

ELISA immunanalyzer (Toxicology)	\$ 75,000
LC/MS (Toxicology)	\$300,000
2 GC/MS (Drug Chemistry)	\$175,000
2017 EQUIPMENT COST COMMITMENTS	\$550,000

SUPPLIES & TESTING

Drug Chemistry supplies 2015/2016 (2014 \$18,100; 2015 \$25,912; 2016 \$40,000)	\$ 30,000
Toxicology supplies and testing 2015/16 (2014 \$57,965; 2015 \$153,663; 2016 \$225,000)	\$167,000
2015/16 SUPPLIES & TESTING COST	\$197,000
2017 SUPPLIES & TESTING COST COMMITMENTS	\$225,000

TRANSPORT

2015/16 Body transport	\$142,000
TOTAL TRANSPORT COST & ANTICIPATED 2015-16	\$142,000
2016/17	\$150,000
2017/18 Anticipated (1/2 year)	\$100,000
TOTAL TRANSPORT COST & ANTICIPATED 2017	\$250,000

TOTAL COSTS AND ANTICIPATED COST COMMITMENTS 2015-2017	\$1,837,000
---	--------------------

2015/16	\$ 297,000
2017	\$1,540,000
<i>Lab Fund</i>	<i>\$ 550,000</i>
<i>GF</i>	<i>\$ 990,000</i>



**CUYAHOGA COUNTY
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Cleveland, Ohio 44106

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Narrative Bio of:

Thomas P. Gilson, M.D.
Medical Examiner of
Cuyahoga County, Ohio

Dr. Thomas P. Gilson was born in Philadelphia, Pennsylvania and obtained his Bachelor's of Science degree in chemistry from St. Joseph's University and his medical degree from the Medical College of Pennsylvania.

He served his general pathology residency at the University of Cincinnati and would become a Forensic Pathology Fellow at the New York City Medical Examiner's Office.

Before being appointed as Cuyahoga County's first Medical Examiner in June 2011, Dr. Gilson has served as:

- Deputy Chief Medical Examiner for the City of New York
- Deputy Chief Medical Examiner for the State of New Hampshire
- Chief Medical Examiner of Rhode Island AND
- Deputy Chief Medical Examiner for the State of Connecticut

Married, with two children, Dr. Gilson's academic areas of interest are forensic pathology and public health issues, including: suicide, injury prevention and opiate/opioid mortality.

THOMAS P. GILSON, M.D., F.C.A.P.

Home: 3150 Coleridge Road
Cleveland Heights, OH 44118
(718) 757-4827

Work: 11001 Cedar Avenue
Cleveland, OH 44106
(216) 721-5610

WORK EXPERIENCE AND POSTGRADUATE MEDICAL TRAINING

Cuyahoga County Office of Medical Examiner

11001 Cedar Avenue
Cleveland, OH 44106

June 2011- current

Medical Examiner

Duties include: Administration of county agency; performance of autopsies; courtroom testimony; oversight of medical examiners/death investigation and crime laboratory, supervision of employees, establishment and maintenance of external accreditations, strategic planning, public health committee participation, educational activities within the agency, oversight of forensic pathology fellowship program, dissemination of public information with public information officer, liaison with medical, legal and other community groups

Office of Chief Medical Examiner - State of Connecticut

11 Shuttle Road
Farmington, CT 06032

February 2010- May 2011

Deputy Chief Medical Examiner

Duties included: Death investigation, performance of autopsies, resident physician and medical student education, courtroom testimony, supervision of employees, establishment/ maintenance of toxicology (SOFT) and agency (NAME) accreditation, agency administration and strategic planning with Chief Medical Examiner

Office of State Medical Examiners - State of Rhode Island and Providence

Plantations

48 Orms St.
Providence, RI 02904

May 2006- February 2010

Chief Medical Examiner

Duties included: Administration of state agency, attainment and maintenance of accreditation by National Association of Medical Examiners (accreditation

obtained 10/08 provisional, 12/09 full), implementation of web-based computer office system, oversight of and strategic planning for various elements of death investigation, mass fatality planning (including H1N1 response), re-establishment and coordination of Medical Examiners Commission (provides agency oversight and guidance), community interface as agency spokesperson, principle investigator in federal public health grant for violent death reporting, death investigation, implementation of statewide uniform infant death investigation protocol, performance of autopsies, testifying in court and education of physicians-in-training.

Office of Chief Medical Examiner - City of New York

520 First Avenue

New York, NY 10016

OCME- NYC

Nov 2002 – April 2006 City Medical Examiner (Manhattan)

Sept 1997 - Mar 1998 Acting Deputy Chief Medical Examiner (Staten Island)

July 1995 - Aug 1997 City Medical Examiner, Kings County (Brooklyn)

July 1994 - June 1995 Medical Examiner, Fellow, Forensic Pathology (Manhattan)
Duties included: Supervision and education of forensic pathology fellows and visiting undergraduate physicians, administration of borough office (97-98), death investigation, performance of autopsies, case triage, testifying in court, and giving lectures. In addition, I served as the coordinator of the weekly, city-wide academic conferences for the office (95-98, 02-05) and founder/moderator of the agency academic journal review club.

Dec 2001 – Oct 2002 Forensic Pathologist
Pima County Office of the Medical Examiner
2825 East District Street
Tucson, AZ 85714

Duties included: Death investigation, performance of autopsies, resident physician and medical student education, courtroom testimony

April 1998 – Nov 2001 Deputy Chief Medical Examiner
Office of Chief Medical Examiner
State of New Hampshire
246 Pleasant St., Suite 218
Concord, NH 03301

Duties included: Death investigation, performance of autopsies, participation in public health committees, education of resident physicians, training and recertification of deputized county medical examiners and testifying in court. I also organized a New England Medical Examiners association with semi-annual meetings attended by

representatives from all six medical examiner offices serving the New England region

July 1990 - June 1994 Resident, Anatomic and Clinical Pathology
Chief Resident, July 1993 - June 1994
University of Cincinnati Medical Center
Cincinnati, OH

July 1988 - June 1990 Intern and Resident, General Surgery
Milton S. Hershey Medical Center
Hershey, PA

EDUCATION

Sept 1984 - June 1988 Doctor of Medicine
Medical College of Pennsylvania
Philadelphia, PA

Sept 1980 - May 1984 Bachelor of Science, Chemistry
St. Joseph's University
Philadelphia, PA
GPA 3.91 (summa cum laude)

PUBLICATIONS

Sams RN, Carver HW, Catanese CA, Gilson TP. "Suicide with Hydrogen Sulfide" paper submitted to the *American Journal of Forensic Medicine and Pathology* August 2010. (Status: accepted)

Semeraro D, Passalacqua NV, Symes S, Gilson T. Patterns of Trauma Induced by Motorboat and Ferry Propellers as Illustrated by Three Known Cases from Rhode Island. *J Forensic Sci* 57(6): 1625-9, 2012.

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(Summarized a survey of emergency department protocols for teen suicide attempts)
- Gilson, T.P. et al. "Morphologic Variations in the External Arcuate Nucleus in Infants Dying of SIDS", *Journal of Forensic Sciences*, July 1994.
- Gilson, T.P. "Invasive Hemophilus Influenza Infection and Serologic Testing", (letter), *Journal of Forensic Sciences*, September 1993.
- Gilson, T.P. and Bendon, R.W. "Megakaryocytosis of the Liver in a Trisomy 21 Stillbirth", *Archives of Pathology and Laboratory Medicine*, July 1993.
- Chen, I., Heminger, L., and Gilson, T. "Stability of serum and plasma intact parathyroid hormone (I-PTH)", *Progress in Clinical Biochemistry*, 1992.
- Gilson, T. and Sollenberger, L. "Adenocarcinoma Arising in an Ileostomy: Report of a Case", *Diseases of the Colon and Rectum*, March 1992.

PRESENTATIONS

- "Investigation of Workplace Fatalities" and "Writing Coherent Reports", Ohio State Coroners Association Annual Meeting, Cleveland, OH, May 2012
- "Suicide by Hydrogen Sulfide". National Association of Medical Examiners 2010 Annual Meeting Cleveland, OH. (with Ralph Sams, MD Rhode Island Hospital *et al.* - Dr. Sams received the John Pless Best Resident Paper Award for his presentation).
- "When the Body is a Crime Scene: Considerations for Healthcare Providers". Connecticut Emergency Nurses Association, September 16, 2010.
- "Estimation of Time of Death". Orange County Medical Examiner Office, June 26, 2009, Goshen, NY
- "Gunshot Wounds". Office of Chief Medical Examiner, State of New Hampshire, April 4, 2009, Concord, NH

“The Medical Examiner and Public Health”. Brown University School of Public Health. December 8, 2008 Providence, RI.

“Propeller Injuries”. Rhode Island Society of Pathologists Fall Meeting, October 23, 2007. Providence, RI.

“Unrecognized Homicide Diagnosed at Exhumation After 42 Years”. National Association of Medical Examiners 2007 Annual Meeting Savannah, GA.

“False Positive Diagnosis of Subarachnoid Hemorrhage and Subdural Hemorrhage by Computerized Tomography”. American Academy of Forensic Sciences 2006 Annual Meeting Seattle, WA (with Sangeeta Sandhu, M.D. St. Luke’s-Roosevelt, NYC and Stephen deRoux, M.D. and Beverly Leffers, M.D. NYC-OCME)

“Responding to an Unauthorized Disclosure of Medical Examiner Information”. National Association of Medical Examiners 2005 Annual Meeting Los Angeles, CA (with Ellen Borakove, B.S., NYC Medical Examiner Office).

“Modern Day Cranial Trephination: The Ventriculostomy”. American Academy of Forensic Sciences 2005 Annual Meeting New Orleans, LA (with B. Anderson, Ph.D. Tucson, AZ Office of the Medical Examiner).

“Toddler death with cervical spine and vertebral artery injury”. National Association of Medical Examiners 2004 Annual Meeting Nashville, TN (with K. Gilmore, M.D. and V. Armbrustmacher, M.D., NYC Medical Examiner Office)

“Non-Accidental Traumatic Deaths in the Workplace, New York City, 1997-2002”. National Association of Medical Examiners 2004 Annual Meeting Nashville TN (with Vincent Tranchida, M.D., NYC Medical Examiner Office)

“Diagnosing Degenerative Pathologies in an Unidentified Skeleton”. American Academy of Forensic Sciences 2004 Annual Meeting Dallas, TX (with S. Kiley, B.A. and A. Zelson-Mundorff, M.A., NYC Medical Examiners Office)

“Suicide with Inert Gases- Addendum to *Final Exit*”. National Association of Medical Examiners 2002 Annual Meeting, Shreveport, LA.

“How Research Informs Diagnosis in SIDS”. Association of SIDS and Infant Mortality Programs Annual Conference, Cambridge, MA March 2002.

“Murder- Suicide in New Hampshire, 1995- 2000”. National Association of Medical Examiners, 2001 Annual Meeting, Richmond, VA (with Craig Campanelli, M.D., Dartmouth Hitchcock Medical Center).

Suicide Data Plenary Session, Panelist. Northeast Injury Prevention Network Invitational Conference for Suicide Prevention Planning, Byfield, MA June 2000.

“Youth Suicide in New Hampshire: A Framework for Discussion”. Getting the Story Right- a workshop for suicide reporting in the media, Concord, NH May 2000.

“Suicidal Hanging: Associated Findings”. Office of Chief Medical Examiner, New York, NY, October 1997.

“Forensic Pathology of Suicide”. University of Cincinnati, Cincinnati, OH, August 1997.

“Geriatric Suicide in New York City, 1990-1994”. American Academy of Forensic Sciences Annual Meeting, New York, NY, February 1997.

“Morphologic Variations in the External Arcuate Nucleus in Infants Dying of SIDS”. American Academy of Forensic Sciences Annual Meeting, Boston, MA, February 1993. (Paper and Presentation awarded Best Resident Paper Award by the AAFS Pathology/Biology Section.)

PROFESSIONAL ORGANIZATIONS

American Academy of Forensic Sciences, 1992-present.

American Society of Clinical Pathologists, 1990-2011.

College of American Pathologists, 1990-2000.

National Association of Medical Examiners, 2001-present

American Association of Suicidology, 2005-2006.

Rhode Island Society of Pathologists, 2006- 2010.

ACADEMIC APPOINTMENTS

Clinical Assistant Professor, Case Western Reserve University School of Medicine, 2011-present.

Instructor, Henry C. Lee College of Criminal Justice and Forensic Sciences, University of New Haven, 2010- 2011

Course Faculty, Annual New England Seminar in Forensic Sciences, Colby College, Waterville, ME, 1999- present.

Workshop Faculty, American Society for Clinical Laboratory Science- Central New England, 2007- 2010.

Clinical Assistant Professor, Department of Pathology and Laboratory Medicine, Brown Medical School, 2007-2010.

Clinical Instructor, Department of Forensic Medicine, New York University, 1994-1998: 2002- 2006.

Clinical Assistant Professor, Department of Pathology, University of Arizona Medical Center, 2002

Adjunct Assistant Professor, Department of Pathology, Dartmouth Medical School, 1998-2001.

Course Co-Director, Pathology, Physician Assistant Master's Program, Notre Dame College, Manchester, NH, 1999-2001 (Teaching Awards 1999,2001).

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Course Director, Pathophysiology Module, Physician Assistant School, State University of New York,
Brooklyn Campus, 1996-1998.

Clinical Instructor, Department of Pathology and Laboratory Medicine, University of Cincinnati, 1993-
1994.

BOARD CERTIFICATIONS

Forensic Pathology, American Board of Pathology, May 1995.

Anatomic and Clinical Pathology, American Board of Pathology, November 1994.