VIRGINIA DEPARTMENT OF HEALTH

OFFICE OF THE CHIEF MEDICAL EXAMINER

"To promote and protect the health of all Virginians"

Fatal Drug Overdose Quarterly Report

4TH QUARTER 2017

Edition 2017.4

Publication Date:
April 2018

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

METHODS, CONSIDERATIONS, AND LIMITATIONS

This quarterly report contains the most recent number of drug related deaths in Virginia for the previous quarter. **The numbers represented in this report are preliminary, subject to change, and are most likely slightly under reported at the time of publication** due to operational practices and limitations (specifically case turnaround time for reports) within the agency; therefore updates and/or changes to numbers previously published in past reports should be expected. It is highly recommended that when citing these data and reports, the edition number is included.

Data analyzed in the report is obtained from the Virginia Medical Examiner Database System (VMEDS). VMEDS is an internal agency database which contains detailed information on all deaths reported to the OCME. Data presented in this report is based upon accepted cases of either full autopsy or external exams. All manners of fatal drug overdoses (accident, homicide, suicide, and undermined) are included in this report.

Due to the nature of law enforcement and OCME death investigation, all deaths presented in this report are based upon locality of occurrence and not residential status of the decedent. The numbers and rates of these death by locality of injury and drug name/drug category are available in separate documents **(http://www.vdh.virginia.gov/medical-examiner/forensic-epidemiology/).**

This report compiles data on drugs causing or contributing to death in fatal drug overdose cases. This report does not include data on drugs detected, but not contributing or causing death.

Often, drug-related deaths have more than one drug causing or contributing to death. Therefore, deaths in which multiple categories of drugs caused or contributed to death will be represented once within each drug category, but multiple times within the entire report. Example: a fatal cocaine, heroin, and alprazolam overdose death will be counted in the cocaine summary, the heroin summary, and the benzodiazepine summary.

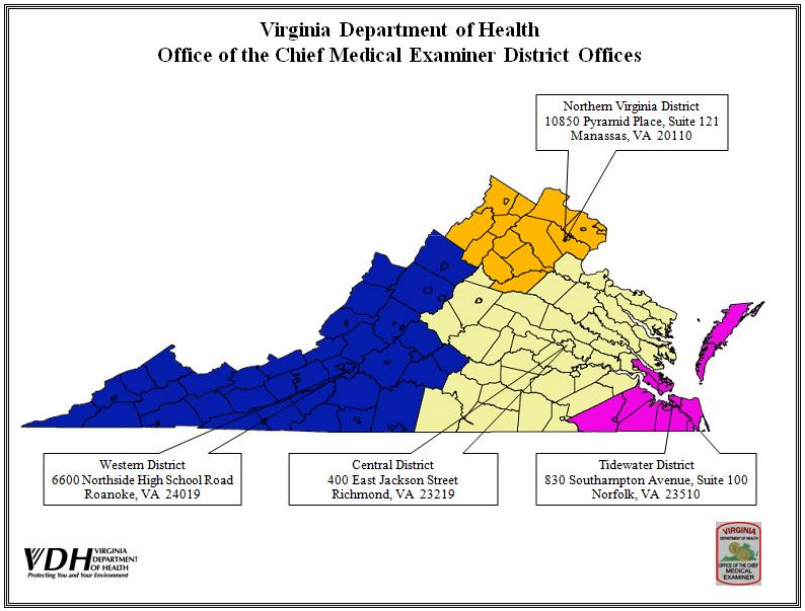
Prescription Opioids analyzed in this report include buprenorphine, codeine, hydrocodone, hydromorphone, levorphanol, meperidine, methadone, morphine, oxycodone, oxymorphone, pentazocine, propoxyphene, tapentadol, and tramadol and are included in the category of 'Prescription Opioids'. Benzodiazepines analyzed in this report include alprazolam, clonazepam, diazepam, flurazepam, lorazepam, midazolam, nordiazepam, oxazepam, temazepam, and triazolam and are included in the category of 'Benzodiazepines'.

Projected estimates for 2017 (entire year) are calculated based upon initial counts by quarter, average toxicology turnaround time at the time of the report, the date of data analysis, and previous quarter fatality trend review.

Rate calculations are based upon Virginia population projections. These population estimates came from the Virginia Department of Health, Division of Health Statistics (http://www.vdh.virginia.gov/HealthStats/stats.htm).

Quarters are based upon calendar year and are defined as follows:

- Quarter 1 (Q1)- January 1st - March 31st
- Quarter 2 (Q2)- April 1st – June 30th
- Quarter 3 (Q3)- July 1st – September 31st
- Quarter 4 (Q4)- October 1st – December 31st



MAIN TAKEAWAYS

- Fatal drug overdose has been the leading method of unnatural death in Virginia since 2013 and the leading method of accidental death since 2014
- Opioids have been the driving force behind the large increases in fatal overdoses since 2013
- In 2015 statewide, the number of illicit opioids deaths surpassed Rx opioid deaths. This trend continued at a greater magnitude in 2016 and 2017
- There has not been a significant increase or decrease in fatal Rx opioid overdoses over the 10 year time span (2007-2016)
- Fentanyl (Rx, illicit, and analogs) caused or contributed to death in over 50% of fatal overdoses in 2017
- Rural areas of Virginia have the highest mortality rates due to Rx opioids while urban areas have the highest mortality rates due to illicit opioids
- Virginia experienced the largest increase (38.9%) in the number of fatal overdoses on record in 2016 compared to 2015. Although 2017 numbers surpassed those of 2016, the rate of change (7.5% increase) was not as significant as that seen in 2016 compared to 2015.

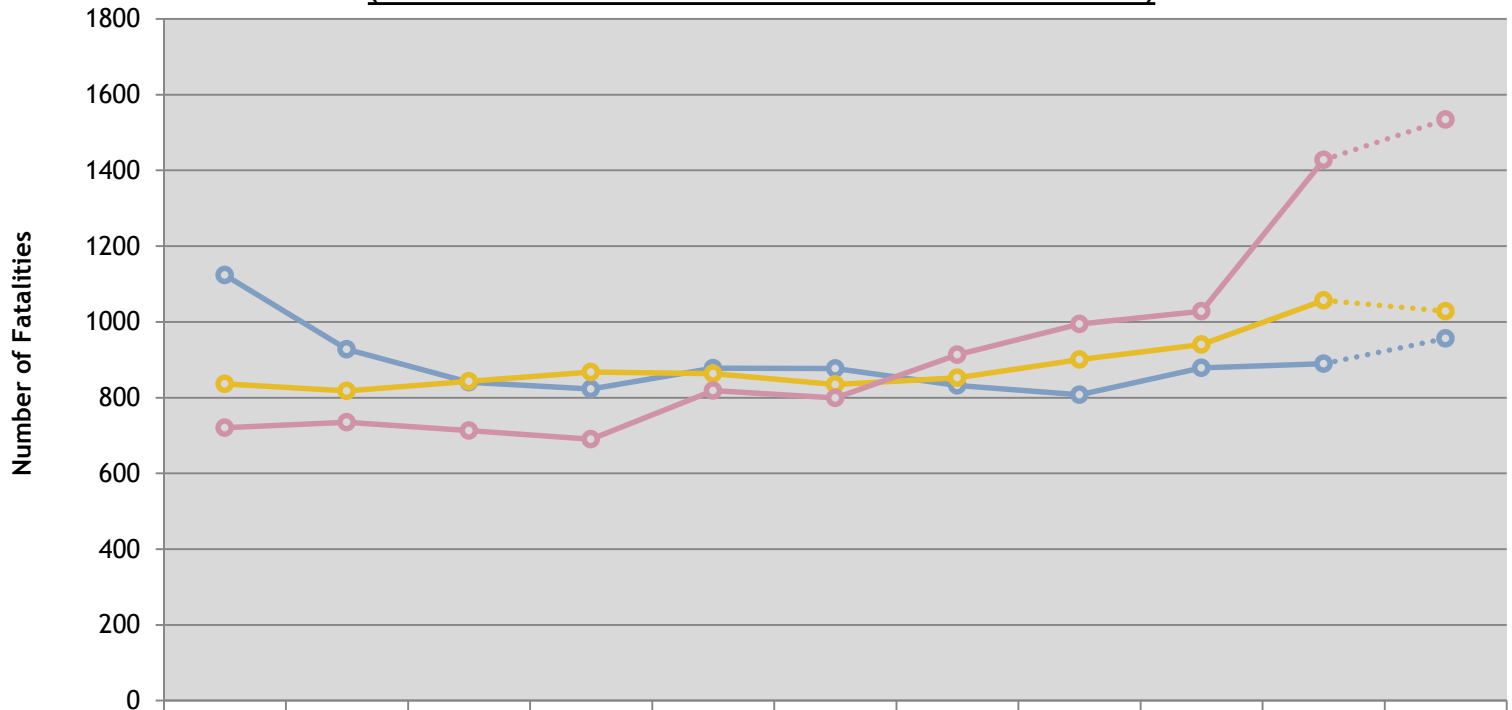
Data for 2017 is Not Final

At the time of this analysis, approximately 40 cases from 2017 remained open, awaiting additional reports to certify cause and manner of death. These remaining cases may or may not be fatal drug overdoses and are not represented in this analysis. Therefore, numbers for 2017 are preliminary and subject to change.

TOP 3 METHODS OF UNNATURAL DEATH

The leading methods of unnatural death in Virginia since 2007 have been motor vehicle collisions, gun-related deaths, and fatal drug overdoses (these methods of death include all manners of death: accident, homicide, suicide, and undetermined). In 2013, fatal drug overdose became the leading method of unnatural death in the Commonwealth. This trend has continued to worsen at a greater magnitude due mainly to illicit opioids (heroin, illicit fentanyl, and fentanyl analogs).

Total Number of Motor Vehicle, Gun, and Drug Related Fatalities by Year of Death, 2007-2017
(Data for 2017 is a Predicted Total for the Entire Year)



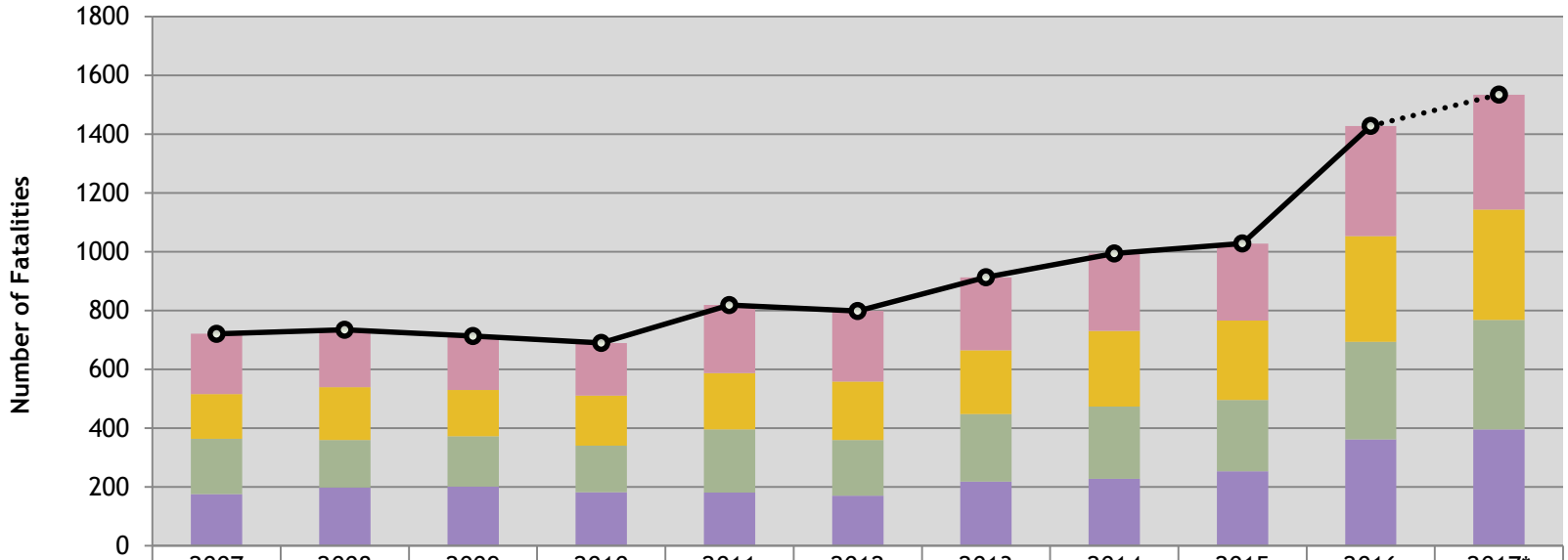
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Motor Vehicle Related	1124	928	841	823	878	877	832	808	879	890	956
Gun Related	836	818	843	868	863	835	852	901	940	1057	1028
Fatal Drug Overdose	721	735	713	690	819	799	913	994	1028	1428	1534

[1] Top 3 methods of death (motor vehicles, guns, and drugs) include all manners of death (accident, homicide, suicide, and undetermined)

ALL DRUGS

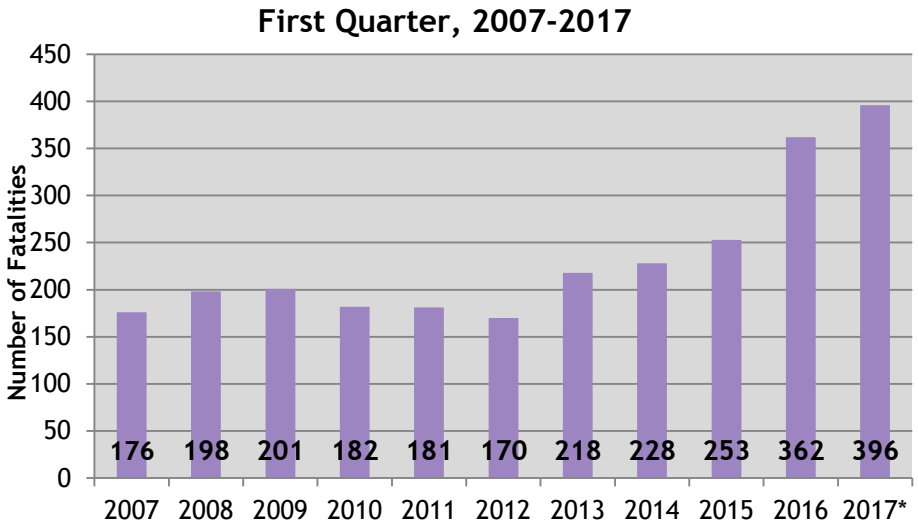
The total number of fatal drug overdoses statewide has increased each year. In 2013, fatal drug overdose became the number one method of unnatural death in the Commonwealth, surpassing both motor vehicle-related fatalities and gun-related fatalities. In 2014, fatal drug overdose became the leading cause of accidental death in Virginia. The number of all fatal overdoses in 2016 compared to 2015 increased by 38.9%---a record setting statistic---and preliminary estimates indicate an over 7.5% increase in the number of all fatal overdoses from 2016 to 2017.

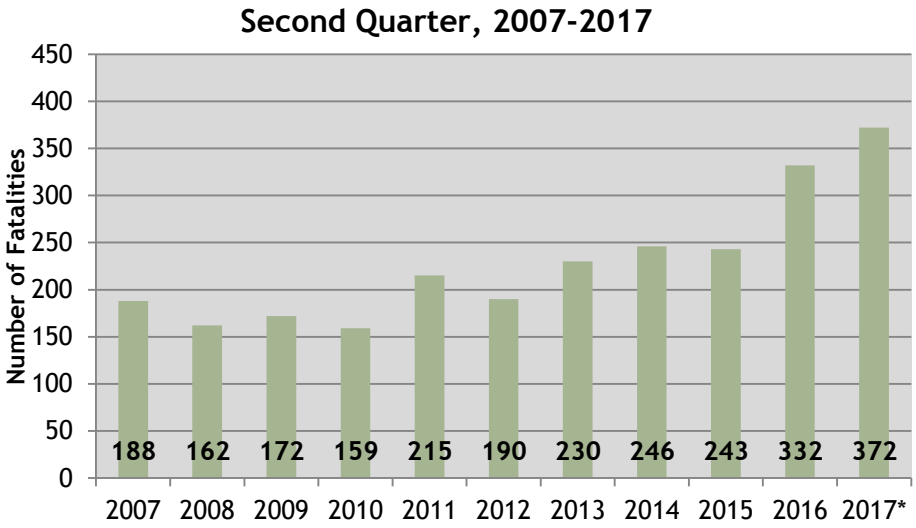
Total Number of Fatal Drug Overdoses by Quarter and Year of Death, 2007-2017
(‘Total Fatalities’ for 2017 is a Predicted Total for the Entire Year)

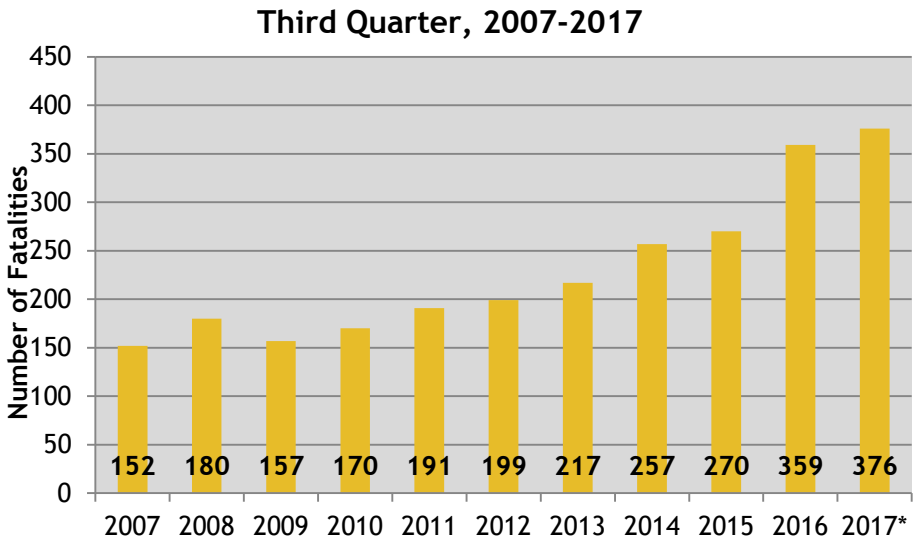


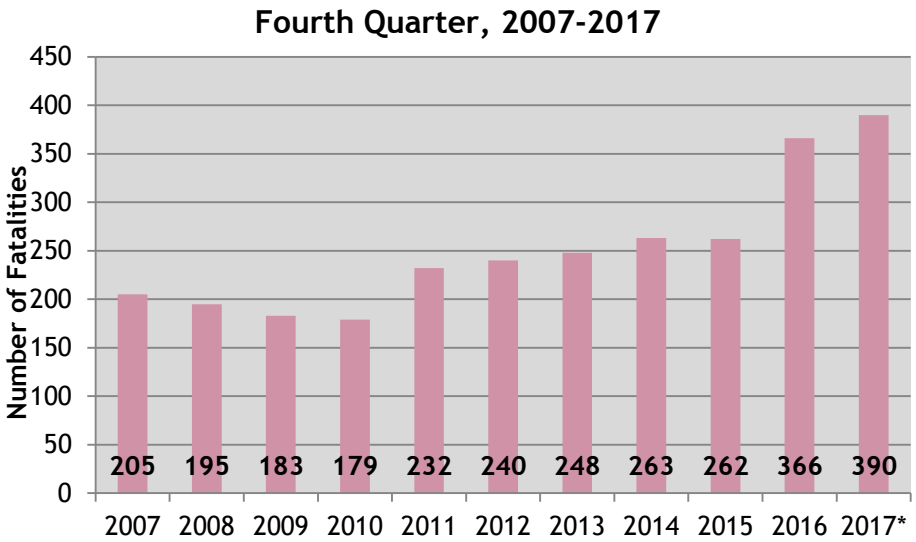
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Q4	205	195	183	179	232	240	248	263	262	375	390
Q3	152	180	157	170	191	199	217	257	270	359	376
Q2	188	162	172	159	215	190	230	246	243	332	372
Q1	176	198	201	182	181	170	218	228	253	362	396
Total Fatalities	721	735	713	690	819	799	913	994	1028	1428	1534

ALL DRUGS

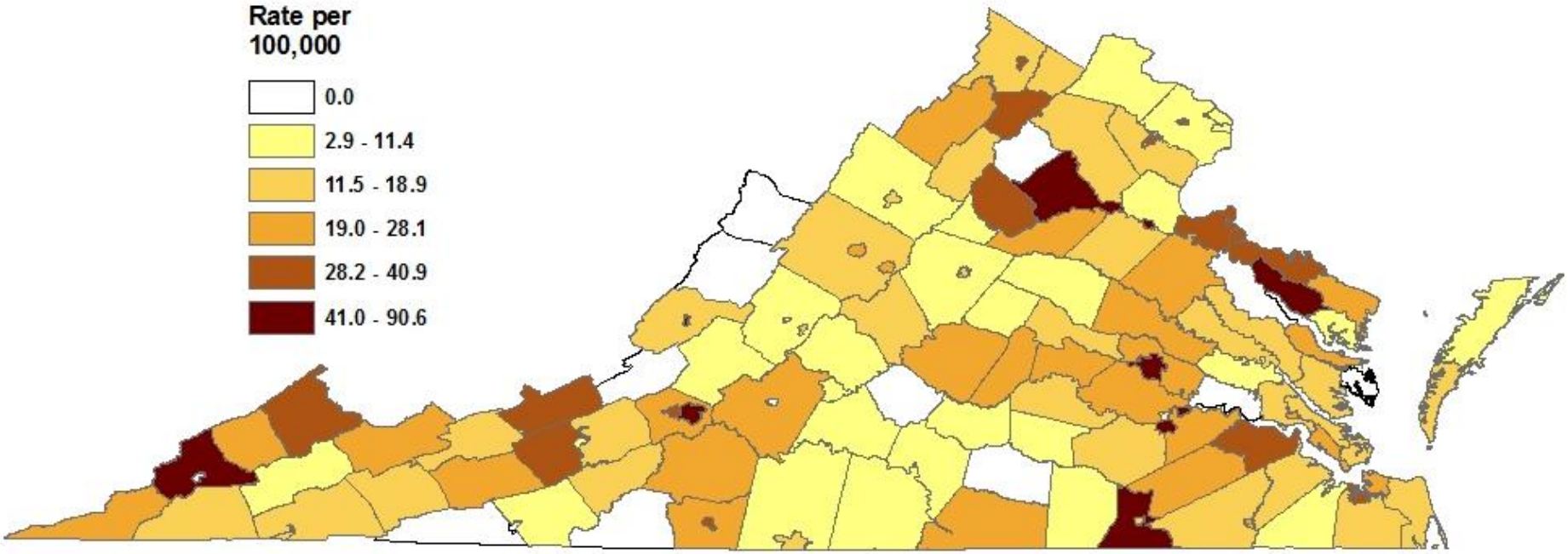

First Quarter, 2007-2017
Number of Fatalities
450
400
350
300
250
200
150
100
50
0
176 198 201 182 181 170 218 228 253 362 396
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Second Quarter, 2007-2017
Number of Fatalities
450
400
350
300
250
200
150
100
50
0
188 162 172 159 215 190 230 246 243 332 372
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Third Quarter, 2007-2017
Number of Fatalities
450
400
350
300
250
200
150
100
50
0
152 180 157 170 191 199 217 257 270 359 376
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Fourth Quarter, 2007-2017
Number of Fatalities
450
400
350
300
250
200
150
100
50
0
205 195 183 179 232 240 248 263 262 366 390
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*

Rate of All Fatal Drug Overdoses by Locality of Overdose, 2017



Source: Virginia Department of Health, Office of the Chief Medical Examiner

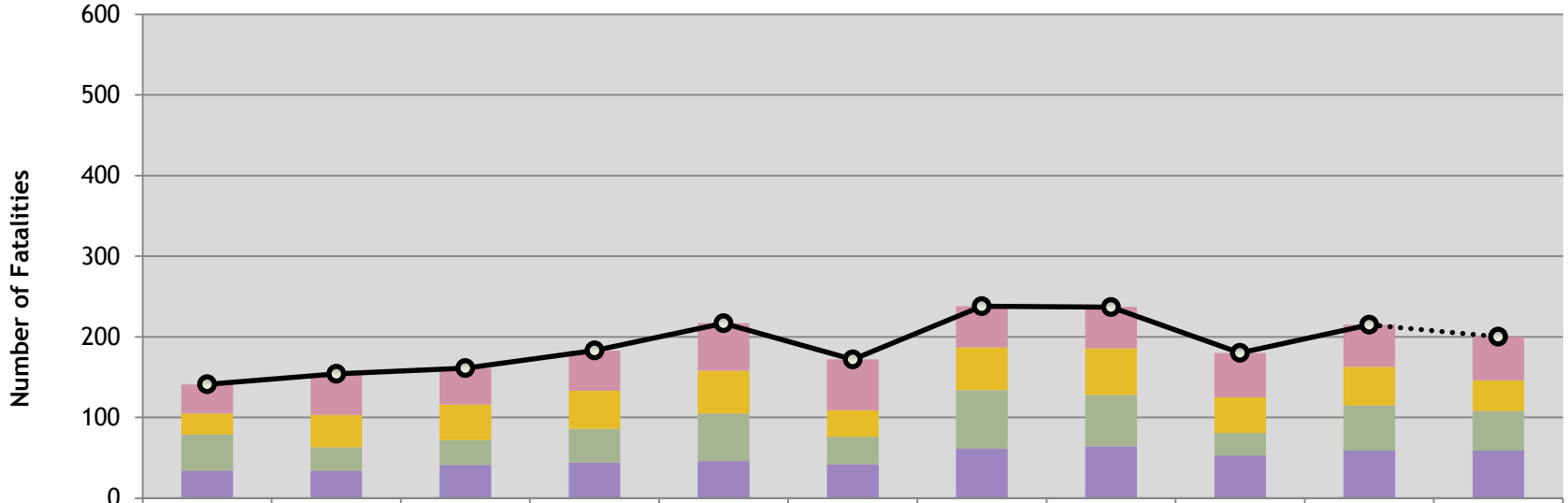
FATAL DRUG OVERDOSES BY NAME/CATEGORY

- Benzodiazepines
- Cocaine
- Fentanyl
- Heroin
- Prescription Opioids (excluding Fentanyl)

BENZODIAZEPINES

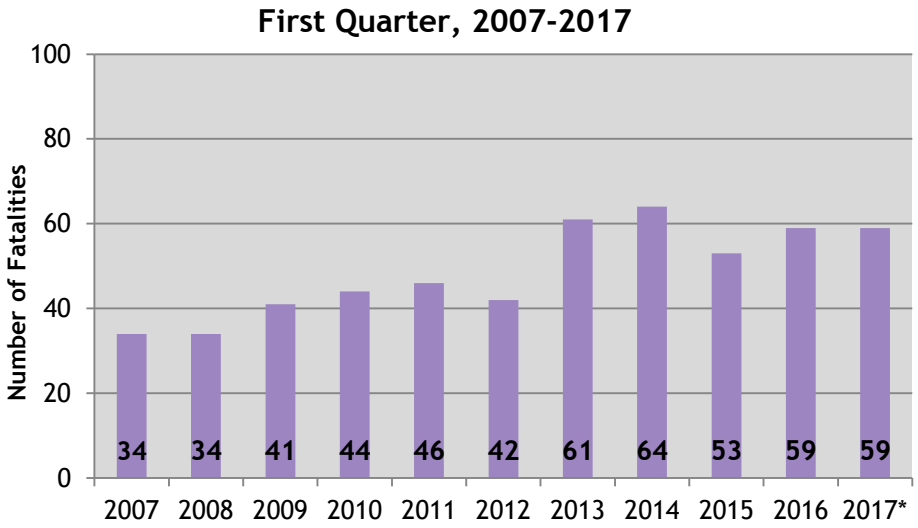
The number of fatal benzodiazepine-related overdoses has fluctuated each year. It is very uncommon for a decedent to fatally overdose on one or more benzodiazepines alone. However, when a person ingests other substances (e.g. alcohol, opiates, methamphetamine) in addition to larger, nontherapeutic amounts of benzodiazepines, the user is potentially creating a lethal cocktail of mixed substances. Fatal benzodiazepine overdoses often had one or more prescription opioids (excluding fentanyl) causing or contributing to death; however, this proportion has slowly decreased in recent years from nearly 90% in 2007 to 59.0% in 2017.

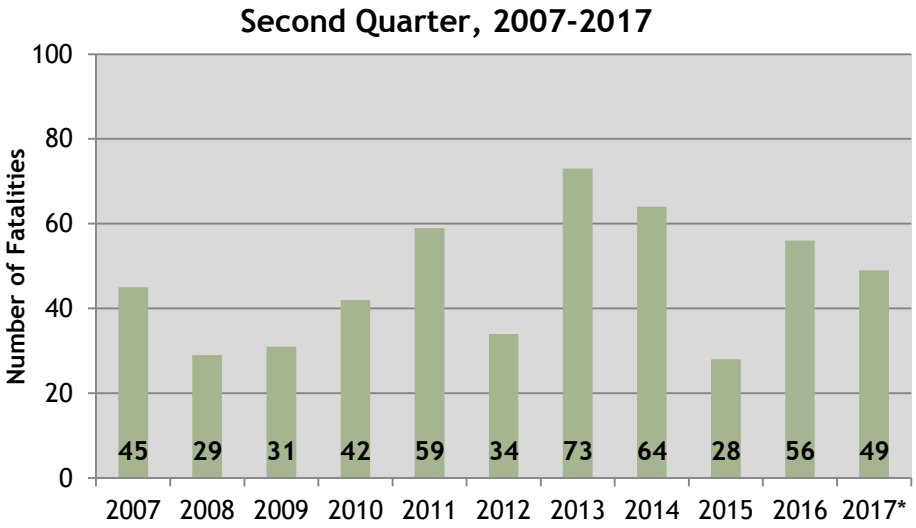
Total Number of Fatal Benzodiazepine Overdoses by Quarter and Year of Death, 2007-2017
('Total Fatalities' for 2017 is a Predicted Total for the Entire Year)

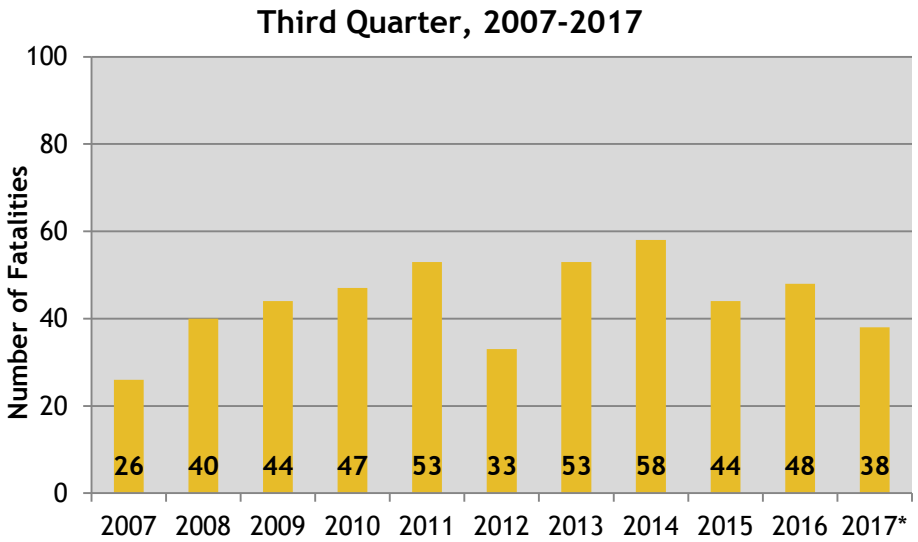


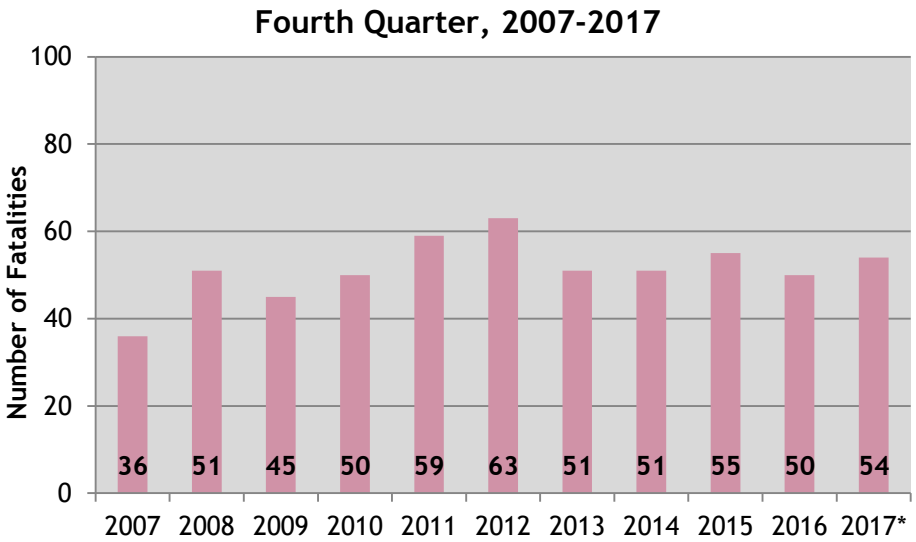
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Q4	36	51	45	50	59	63	51	51	55	52	54
Q3	26	40	44	47	53	33	53	58	44	48	38
Q2	45	29	31	42	59	34	73	64	28	56	49
Q1	34	34	41	44	46	42	61	64	53	59	59
Total Fatalities	141	154	161	183	217	172	238	237	180	215	200

BENZODIAZEPINES



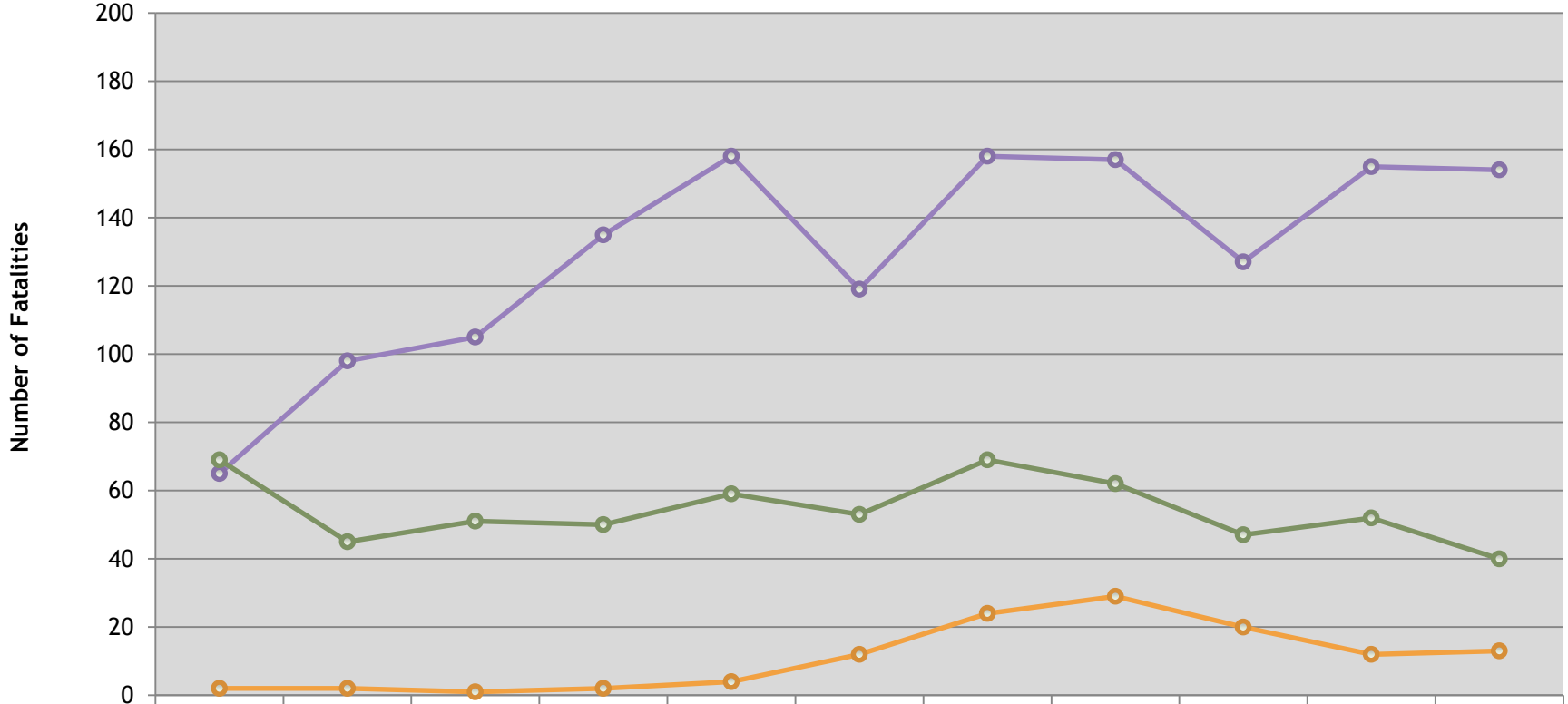






BENZODIAZEPINES

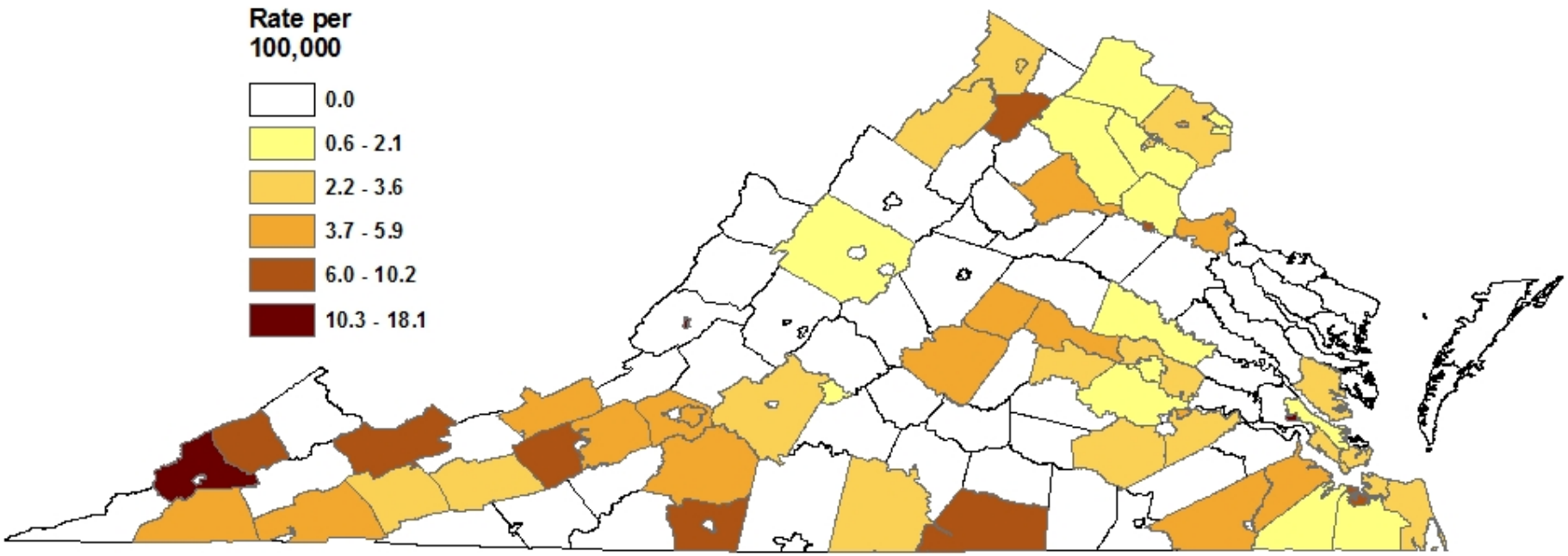
Total Number of Fatal Benzodiazepine Overdoses by Drug Name and Year of Death, 2007-2017
(Data for 2017 is a Predicted Total for the Entire Year)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Alprazolam	65	98	105	135	158	119	158	157	127	155	154
Clonzepam	2	2	1	2	4	12	24	29	20	12	13
Diazepam	69	45	51	50	59	53	69	62	47	52	40

[1] Flurazepam, lorazepam, midazolam, nordiazepam, oxazepam, temazepam and triazolam were excluded from this analysis because of low annual case counts (<20 deaths per year)
[2] Each benzodiazepine is tallied by each time it caused or contributed to death (analyzed from either toxicology or the cause of death statement) and therefore the total number of benzodiazepines will far exceed the actual number of fatalities

Rate of Fatal Benzodiazepine Overdoses by Locality of Overdose, 2017

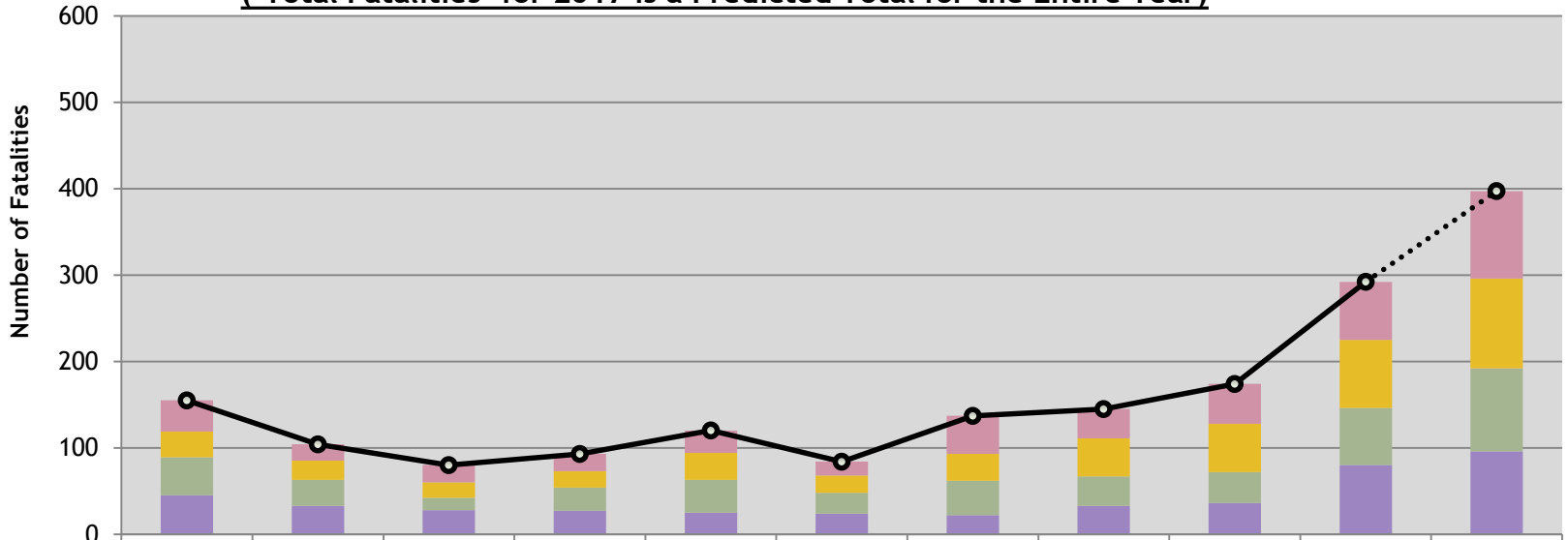


Source: Virginia Department of Health, Office of the Chief Medical Examiner

COCAINE

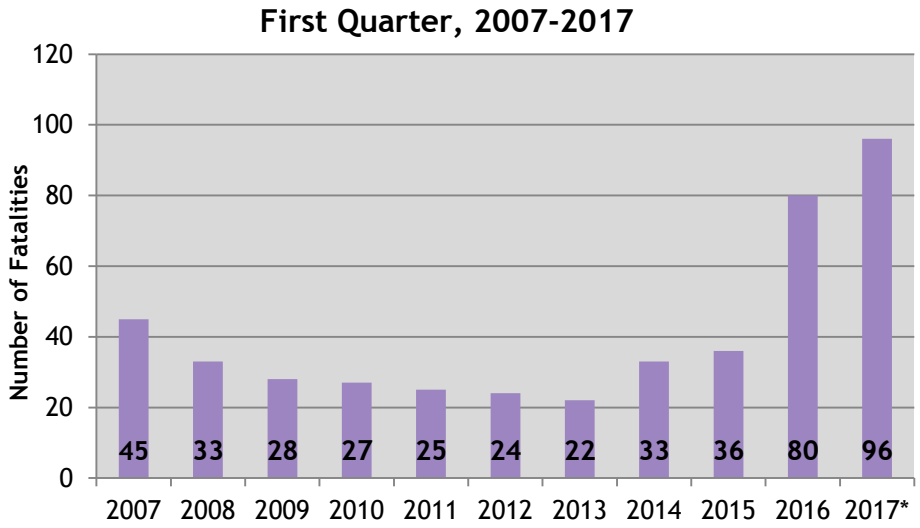
The total number of fatal cocaine-related overdoses statewide has been slowly increasing since 2013. Fatal cocaine overdoses from 2007-2015 typically occurred as the only substance causing or contributing to death, or in addition to lethal combinations of one or more opioid prescription drugs (excluding fentanyl) (36.6%), heroin (24.6%), and/or alcohol at or above the legal limit of 0.08% BAC (16.0%). In 2016 and 2017, over 54% of cocaine deaths also included fentanyl (Rx, illicit, or analogs). The number of fatal cocaine overdoses in 2017 compared to 2016 increased by 36.0%.

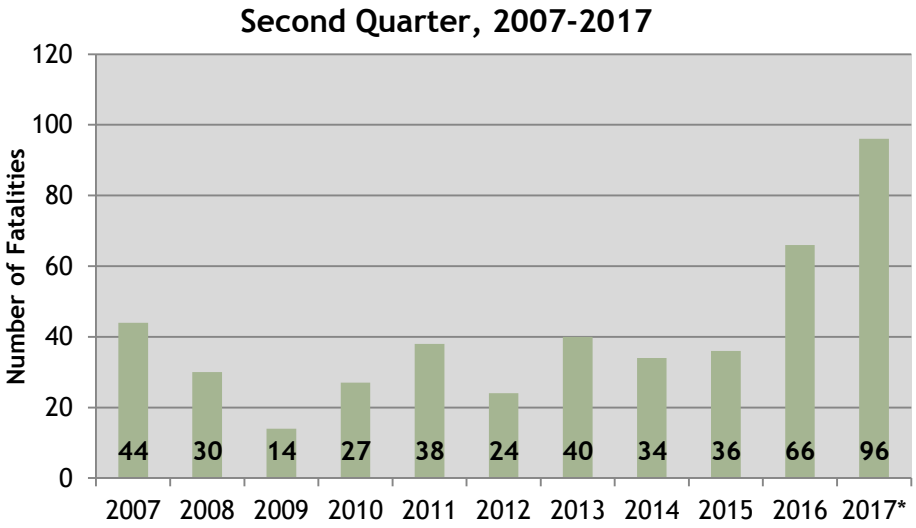
Total Number of Fatal Cocaine Overdoses by Quarter and Year of Death, 2007-2017
('Total Fatalities' for 2017 is a Predicted Total for the Entire Year)

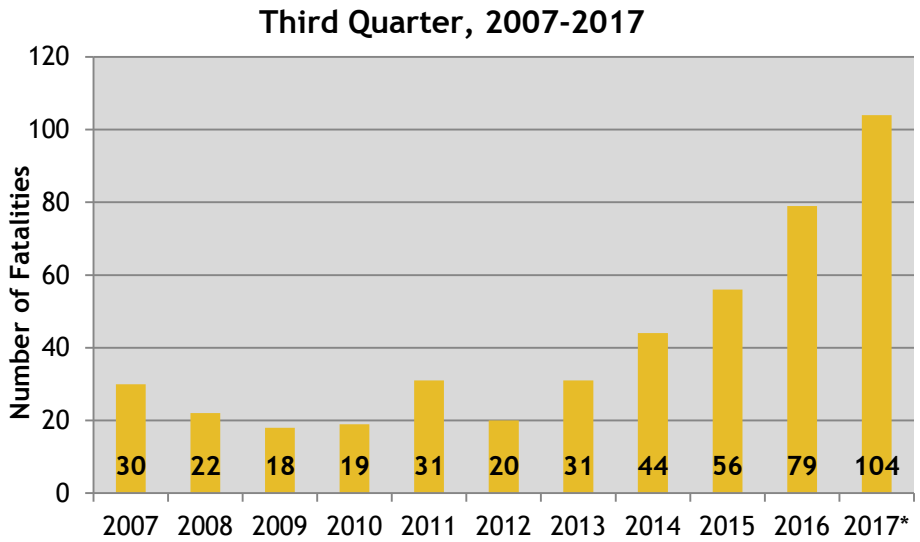


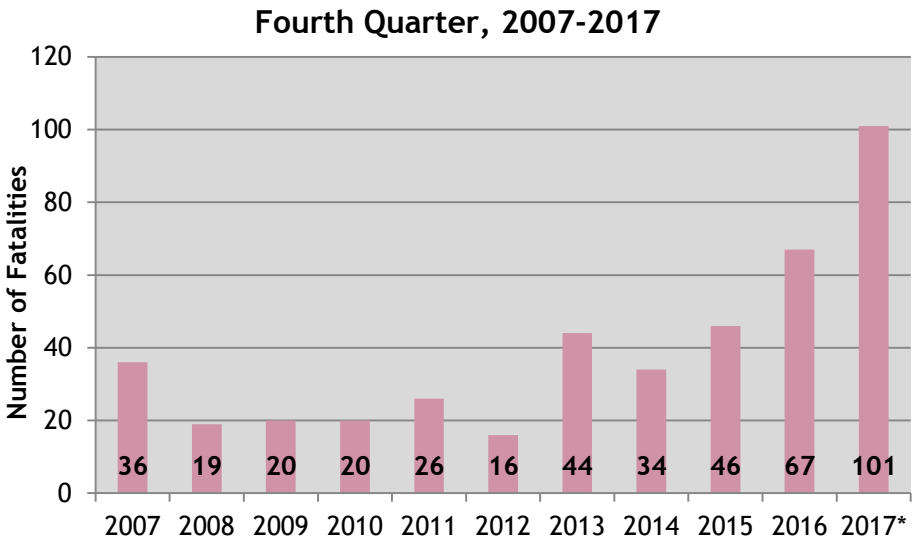
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Q4	36	19	20	20	26	16	44	34	46	67	101
Q3	30	22	18	19	31	20	31	44	56	79	104
Q2	44	30	14	27	38	24	40	34	36	66	96
Q1	45	33	28	27	25	24	22	33	36	80	96
Total Fatalities	155	104	80	93	120	84	137	145	174	292	397

COCAINE

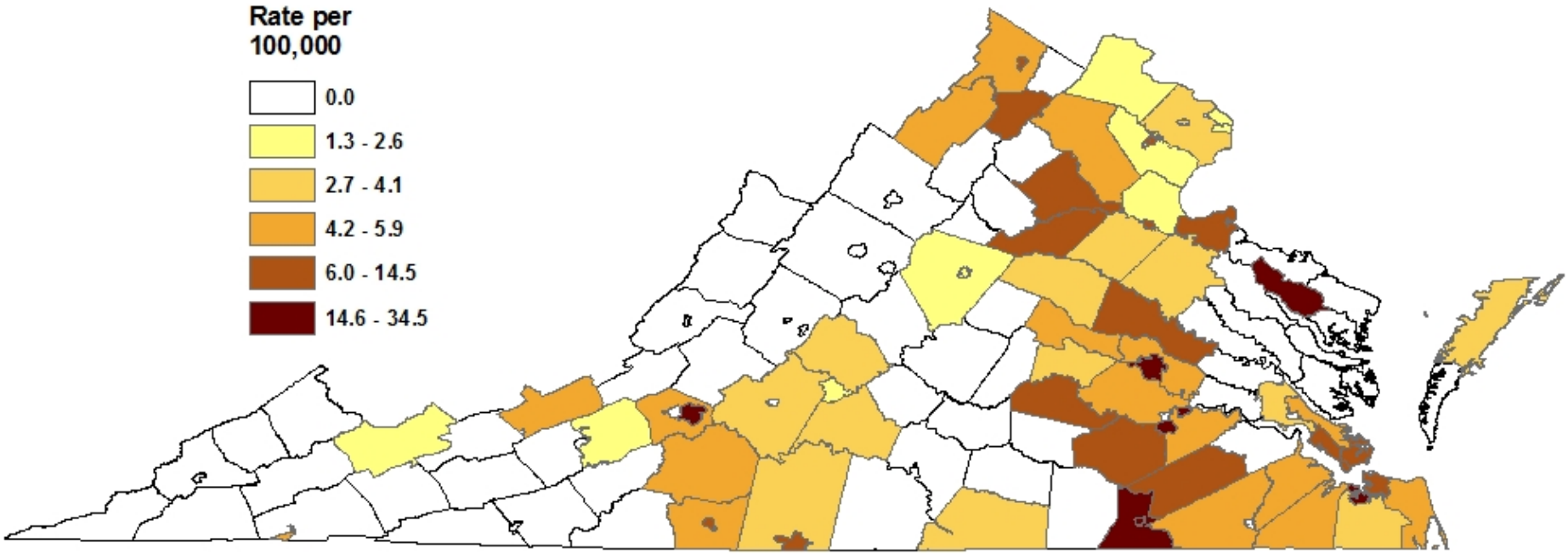

First Quarter, 2007-2017
Number of Fatalities
120
100
80
60
40
20
0
45 33 28 27 25 24 22 33 36 80 96
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Second Quarter, 2007-2017
Number of Fatalities
120
100
80
60
40
20
0
44 30 14 27 38 24 40 34 36 66 96
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Third Quarter, 2007-2017
Number of Fatalities
120
100
80
60
40
20
0
30 22 18 19 31 20 31 44 56 79 104
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Fourth Quarter, 2007-2017
Number of Fatalities
120
100
80
60
40
20
0
36 19 20 20 26 16 44 34 46 67 101
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*

Rate of Fatal Cocaine Overdoses by Locality of Overdose, 2017

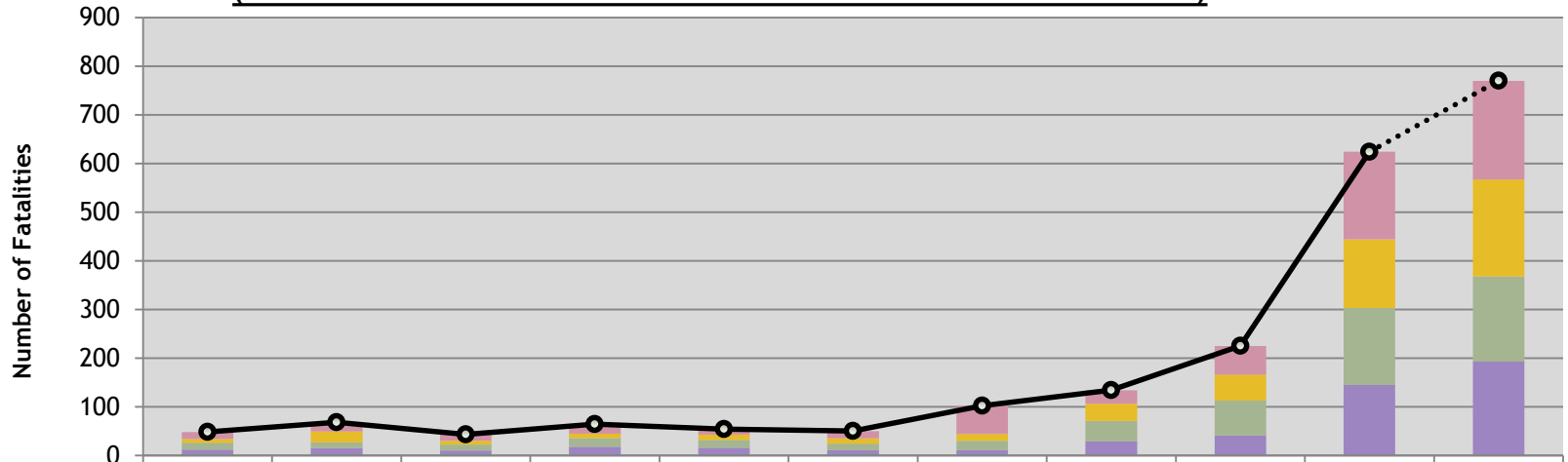


Source: Virginia Department of Health, Office of the Chief Medical Examiner

FENTANYL

The total number of fatal fentanyl-related drug overdoses has sharply increased since 2012; which coincides with the dramatic increase in fatal heroin overdoses. Prior to 2013, most fentanyl-related deaths were due to illicit use of pharmaceutically produced fentanyl. However, in late 2013, early 2014, law enforcement investigations and toxicology testing demonstrated an increase in illicitly produced fentanyl. By 2016, most fatal fentanyl-related overdoses were due to illicitly produced fentanyl and fentanyl analogs, and not pharmaceutically produced fentanyl, with an increase of 177.3% in fentanyl deaths from 2015. For statistical purposes, 'fentanyl' includes all pharmaceutically produced fentanyl, illicitly produced fentanyl, and fentanyl analogs. The number of fatal fentanyl overdoses in 2017 compared to 2016 increased by 23.4%.

Total Number of Fatal Fentanyl Overdoses by Quarter and Year of Death, 2007-2017
('Total Fatalities' for 2017 is a Predicted Total for the Entire Year)

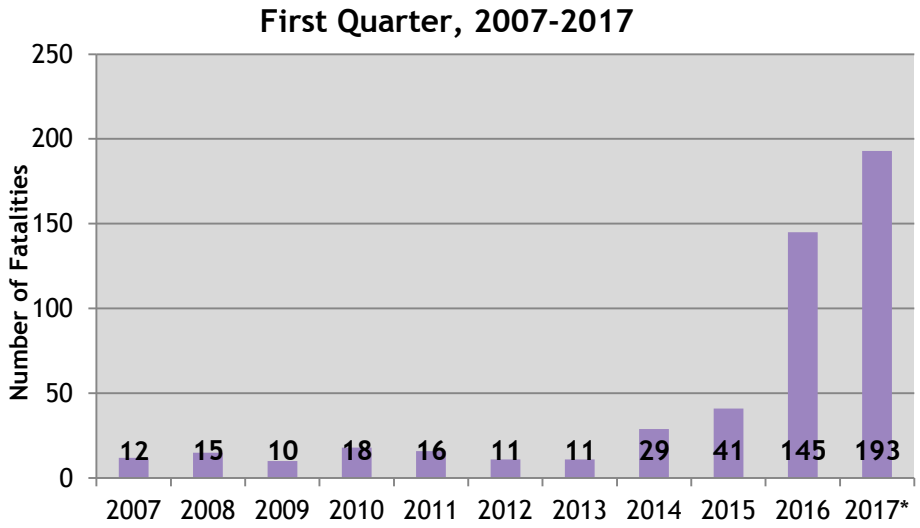


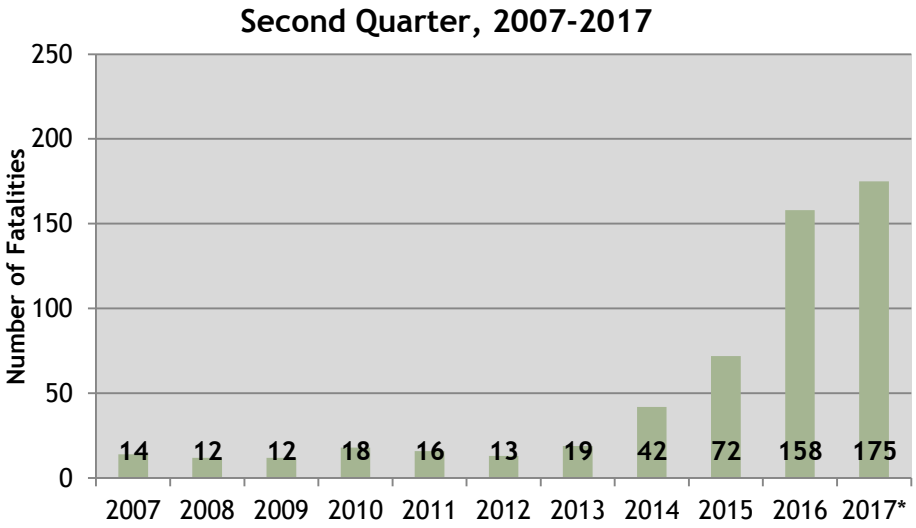
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Q4	14	19	13	19	11	15	58	28	59	180	203
Q3	8	22	8	9	11	11	14	35	53	141	199
Q2	14	12	12	18	16	13	19	42	72	158	175
Q1	12	15	10	18	16	11	11	29	41	145	193
Total Fatalities	48	68	43	64	54	50	102	134	225	624	770

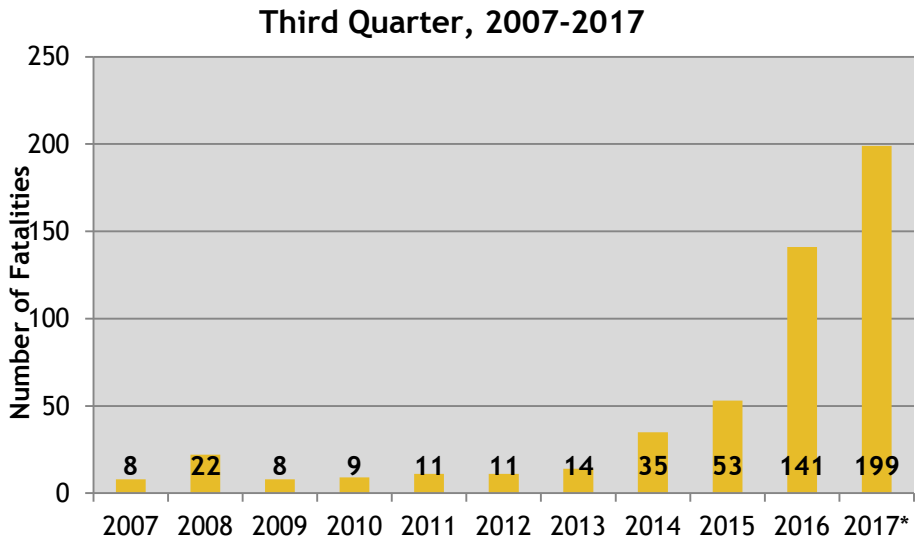
[1] Historically, fentanyl has been categorized as a prescription opioid because it is mass produced by pharmaceutical companies. However, law enforcement investigations and toxicology results have demonstrated that several recent fentanyl seizures have ***not*** been pharmaceutically produced, but illicitly produced. This illicit form of fentanyl is produced by international drug traffickers who import the drug into the United States and often, mix it into heroin being sold. This illicitly produced fentanyl has been the biggest contributor to the significant increase in the number of fatal opioid overdoses in Virginia.

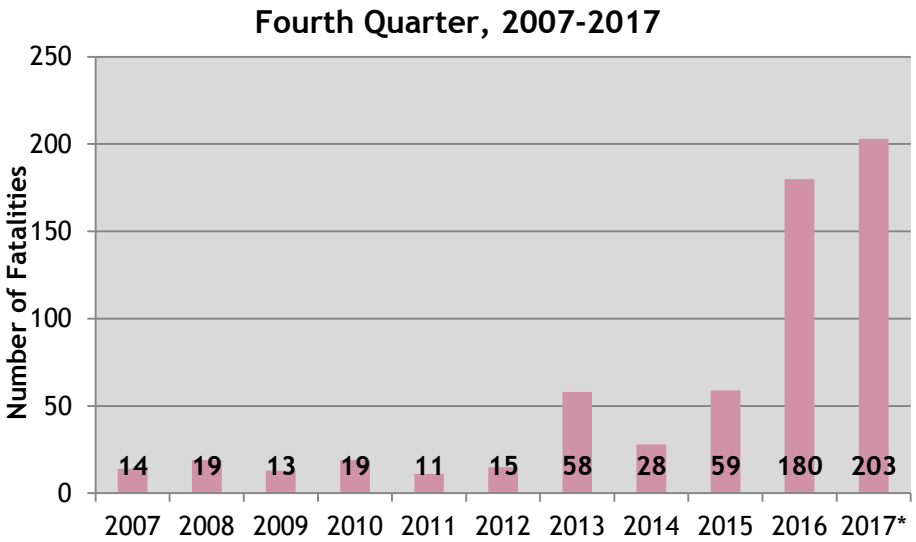
[2] Illicit and pharmaceutically produced fatal fentanyl overdoses are represented in this analysis. This includes all different types of fentanyl analogs (acetyl fentanyl, furanyl fentanyl, etc.)

FENTANYL


First Quarter, 2007-2017
Number of Fatalities
250
200
150
100
50
0
12 15 10 18 16 11 11 29 41 145 193
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Second Quarter, 2007-2017
Number of Fatalities
250
200
150
100
50
0
14 12 12 18 16 13 19 42 72 158 175
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*

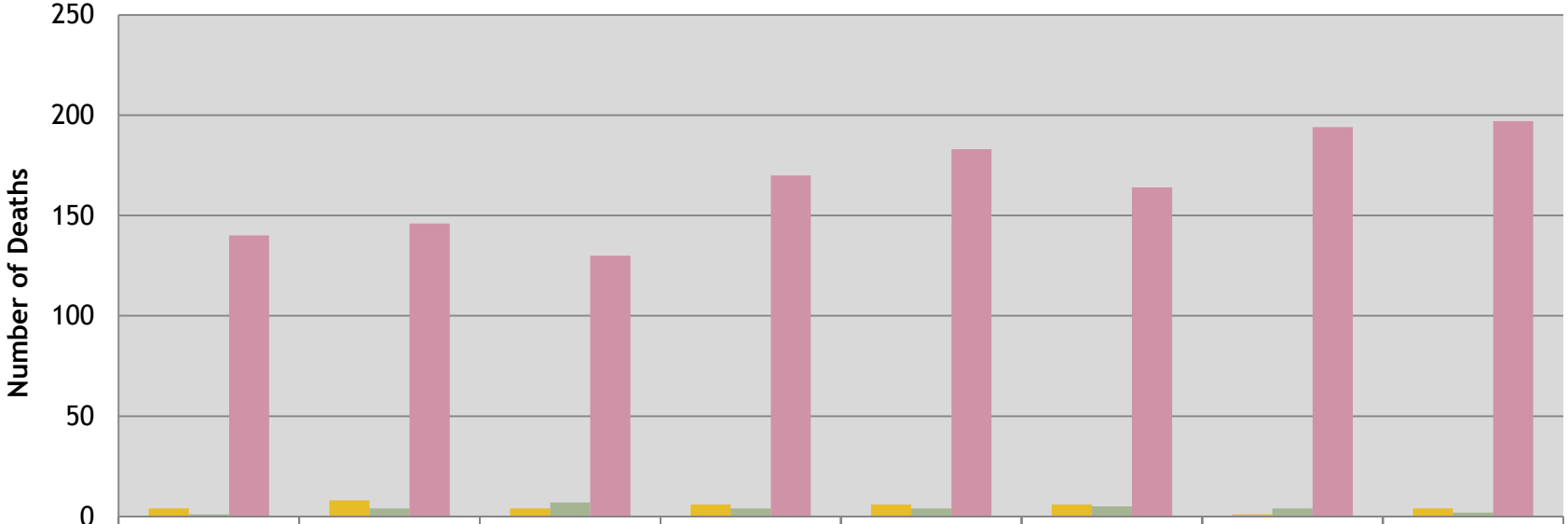

Third Quarter, 2007-2017
Number of Fatalities
250
200
150
100
50
0
8 22 8 9 11 11 14 35 53 141 199
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Fourth Quarter, 2007-2017
Number of Fatalities
250
200
150
100
50
0
14 19 13 19 11 15 58 28 59 180 203
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*

FENTANYL

In 2016, the OCME began collecting information on the suspected origin of fentanyl (pharmaceutical production, illicit production, or unknown) on all fatal overdoses involving fentanyl. The determination is made by reviewing the examination report, toxicology report, police report, and several other sources of information collected during the death investigation process. This classification is more subjective than objective, but still provides detailed insight to the current proportion of illicitly produced fentanyl in Virginia that is contributing to fatal overdoses. In 2017, it was estimated that nearly 96% of fatal fentanyl overdoses were due to the illicitly produced versions of the drug.

Total Number of Fatal Fentanyl Overdoses by Fentanyl Origin and Month of of Death, 2016-2017



	2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Prescription	4	8	4	6	6	6	1	4
Unknown	1	4	7	4	4	5	4	2
Illicit	140	146	130	170	183	164	194	197

[1] Historically, fentanyl has been categorized as a prescription opioid because it is mass produced by pharmaceutical companies. However, recent law enforcement investigations and toxicology results have demonstrated that several recent fentanyl seizures have ***not*** been pharmaceutically produced, but illicitly produced. This illicit form of fentanyl is produced by international drug traffickers who import the drug into the United States and often, mix it into heroin being sold. This illicitly produced fentanyl has been the biggest contributor to the significant increase in the number of fatal opioid overdoses in Virginia.

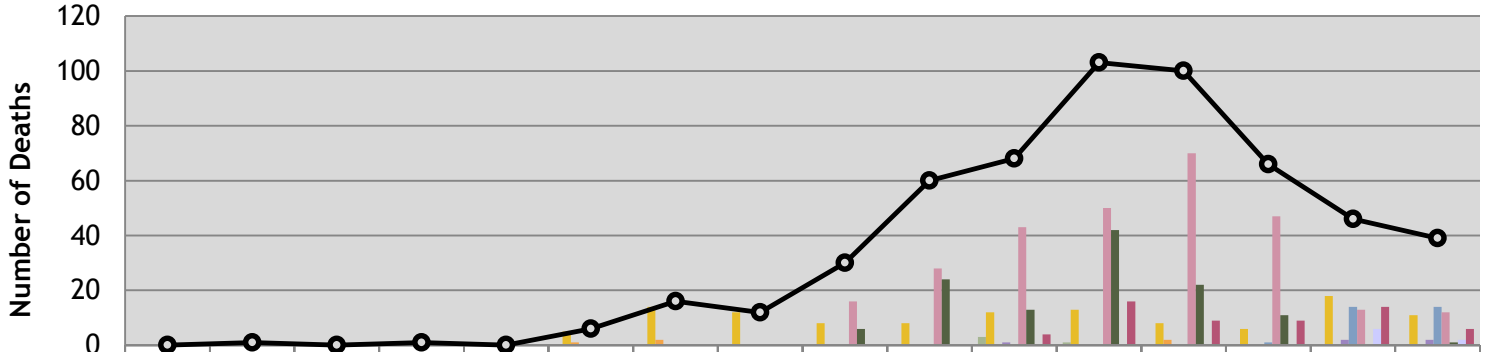
[2] Illicit and pharmaceutically produced fatal fentanyl overdoses are represented in this analysis. This includes all different types of fentanyl analogs (acetyl fentanyl, furanyl fentanyl, etc.)

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

FENTANYL ANALOGS

Fentanyl analogs are a category of illicitly produced opioids very similar to fentanyl, but slightly different in their chemical structure. Fentanyl analogs began appearing in Virginia in 2014 and have risen dramatically since the beginning of 2016. In fatal overdoses, fentanyl analogs are often found with fentanyl and/or two different fentanyl analogs together, and/or heroin or cocaine, or due to the analog itself, without other drugs detected. Fentanyl analogs are illicitly produced and are extremely potent, and can be blamed in part for the significant rise in fatal overdoses due to opioids. For statistical purposes, 'fentanyl' includes all pharmaceutically produced fentanyl, illicitly produced fentanyl, and fentanyl analogs.

Total Number of Fatal Fentanyl Analog Overdoses by Quarter and Year of Death, 2014-2017



	2014				2015				2016				2017*			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
3-Methyl Fentanyl	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0
Acetyl Fentanyl	0	1	0	1	0	5	14	12	8	8	12	13	8	6	18	11
Butyryl Fentanyl	0	0	0	0	0	1	2	0	0	0	0	0	2	0	0	0
Carfentanil	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	2
Cyclopropyl Fentanyl	0	0	0	0	0	0	0	0	0	0	0	0	0	1	14	14
Despropionyl Fentanyl**	0	0	0	0	0	0	0	0	16	28	43	50	70	47	13	12
Furanyl Fentanyl	0	0	0	0	0	0	0	0	6	24	13	42	22	11	0	1
Methoxyacetyl Fentanyl	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2
Para-Fluoroisobutyryl Fentanyl***	0	0	0	0	0	0	0	0	0	0	4	16	9	9	14	6
Total Fentanyl Analog Fatalities	0	1	0	1	0	6	16	12	30	60	68	103	100	66	46	39

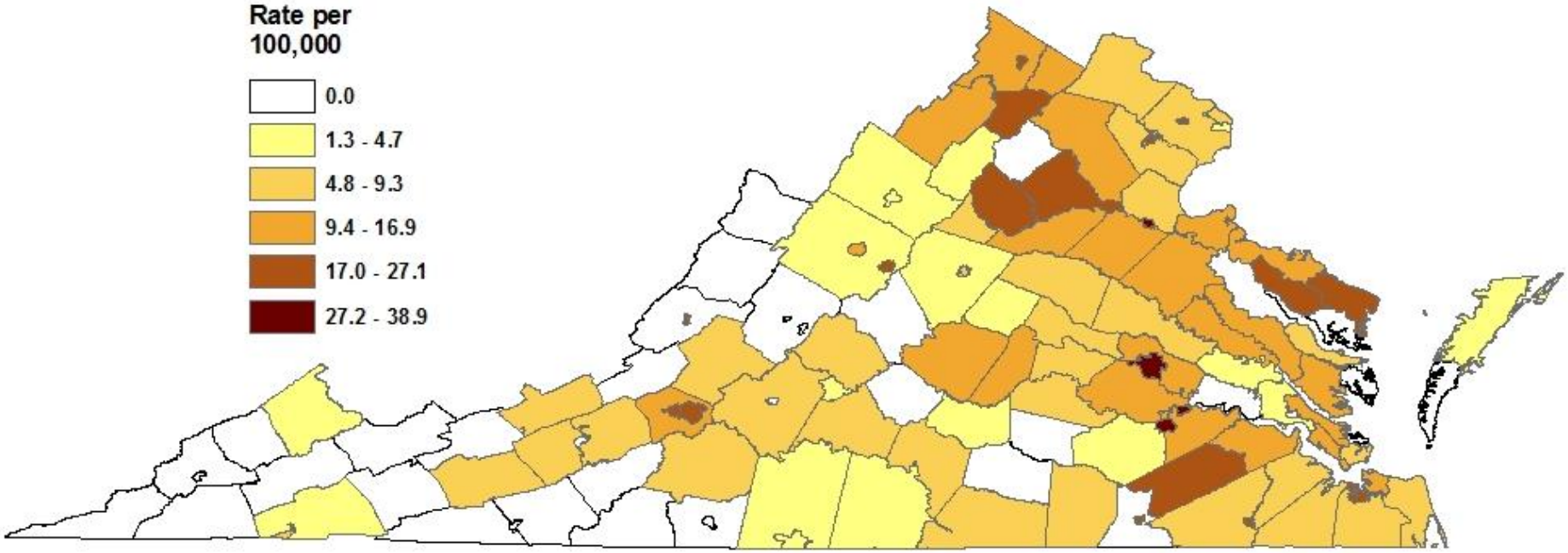
[1] Each fentanyl analog is tallied by each time it caused or contributed to death (analyzed from either toxicology or the cause of death statement) and therefore the total number of analogs will far exceed the actual number of fatalities

2 Despropionyl fentanyl is a major metabolite of furanyl fentanyl. Therefore, numbers presented in the 'despropionyl fentanyl' category control for furanyl fentanyl (despropionyl deaths without furanyl fentanyl).

3 In certain cases, specialized testing through an outside laboratory is needed for toxicology testing. In this laboratory, their testing for para-fluoroisobutyryl fentanyl and para-fluorobutyryl fentanyl cannot distinguish between the two analogs and therefore in this analysis, the two drugs are grouped together under 'para-fluoroisobutyryl fentanyl'

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Rate of Fatal Fentanyl (Rx, Illicit, and Analog) Overdoses by Locality of Overdose, 2017

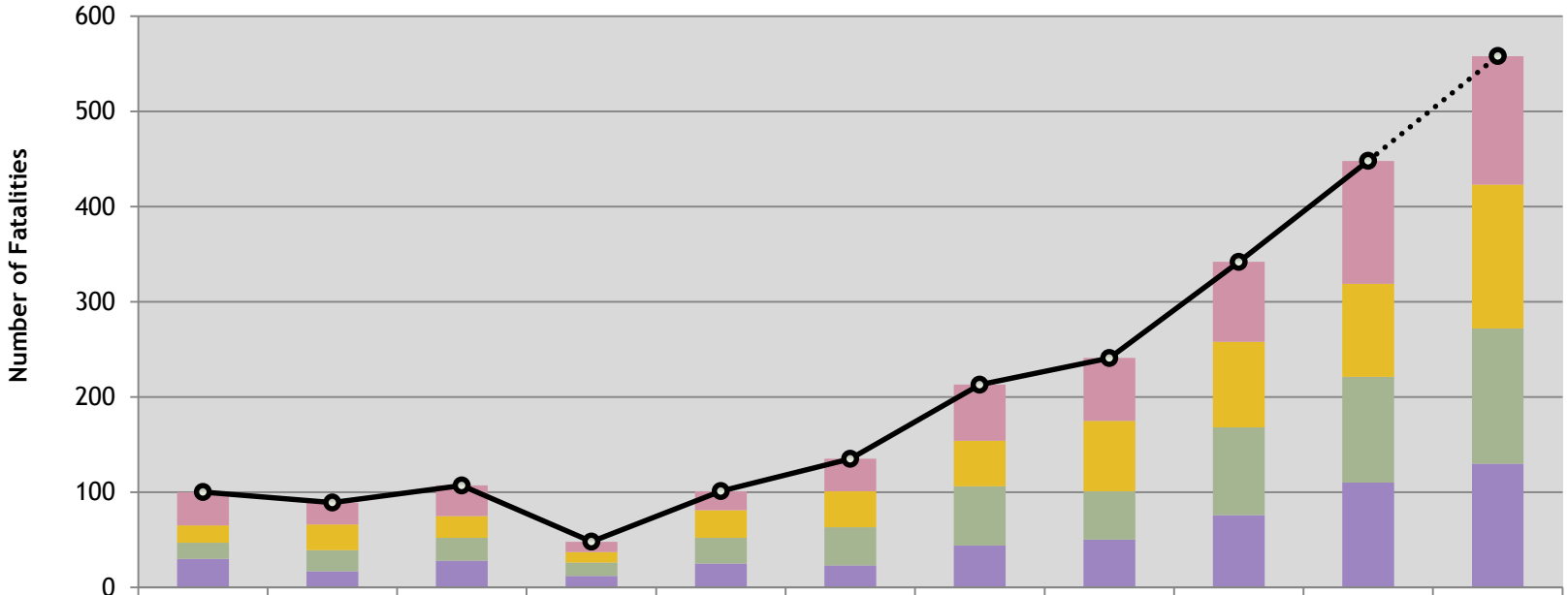


Source: Virginia Department of Health, Office of the Chief Medical Examiner

HEROIN

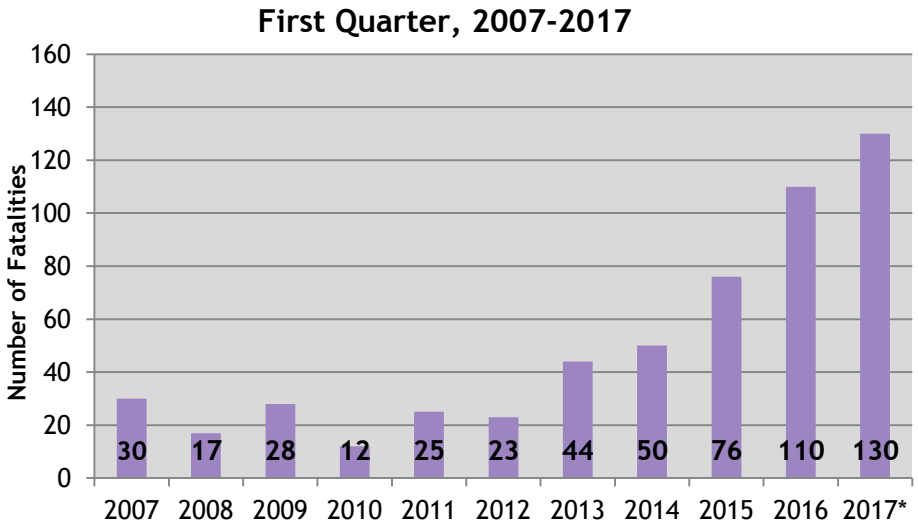
The total number of fatal heroin-related overdoses have been increasing since 2010. Fatal heroin overdoses often occur as the primary drug causing death, but more recently, fentanyl and/or fentanyl analogs in addition to heroin have caused fatal overdoses. Fatal heroin overdoses increased by 24.6% in 2017 when compared to 2016.

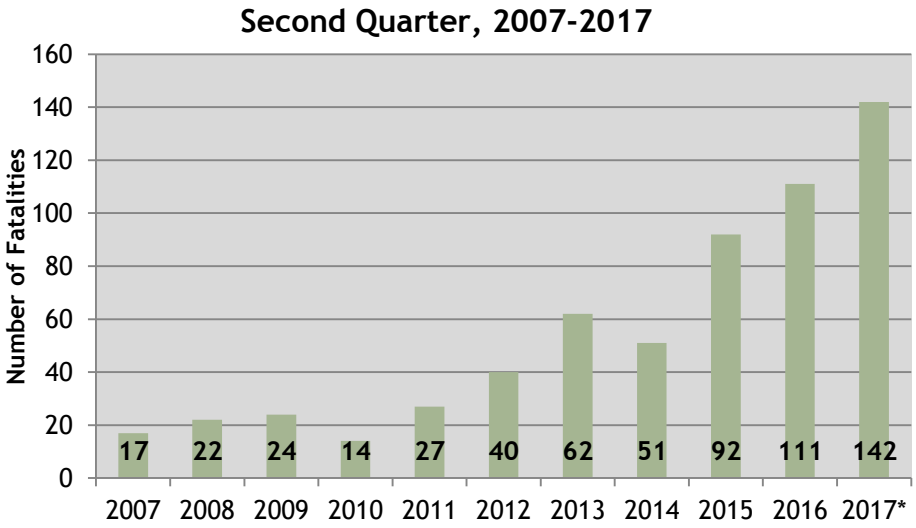
Total Number of Fatal Heroin Overdoses by Quarter and Year of Death, 2007-2017
(‘Total Fatalities’ for 2017 is a Predicted Total for the Entire Year)

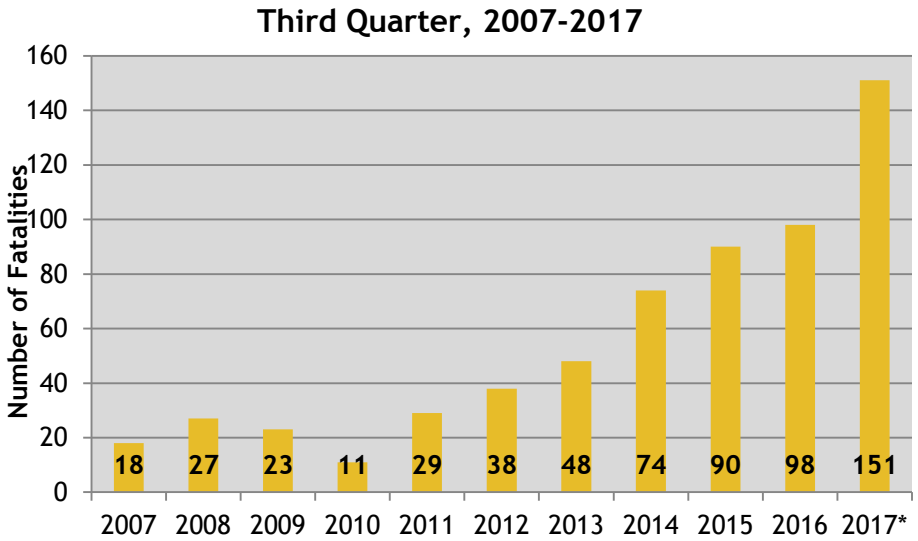


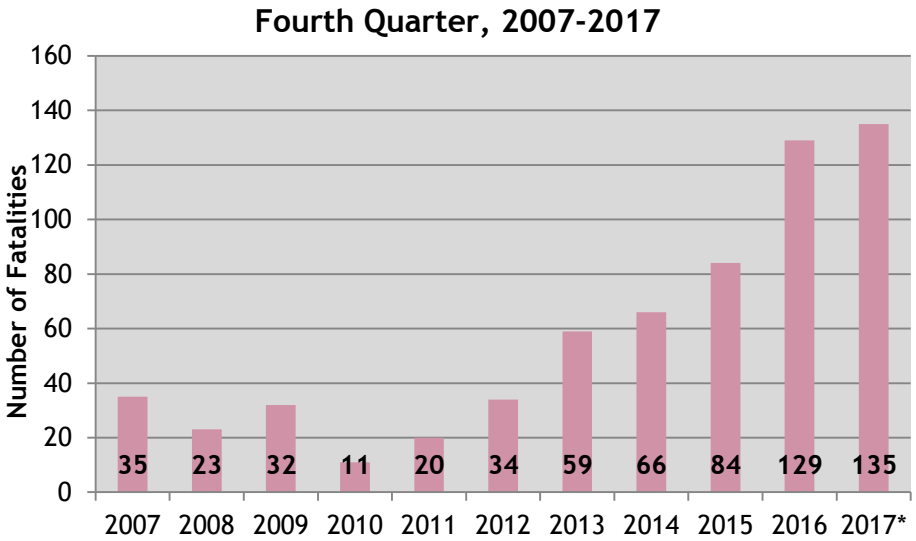
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Q4	35	23	32	11	20	34	59	66	84	129	135
Q3	18	27	23	11	29	38	48	74	90	98	151
Q2	17	22	24	14	27	40	62	51	92	111	142
Q1	30	17	28	12	25	23	44	50	76	110	130
Total Fatalities	100	89	107	48	101	135	213	241	342	448	558

HEROIN

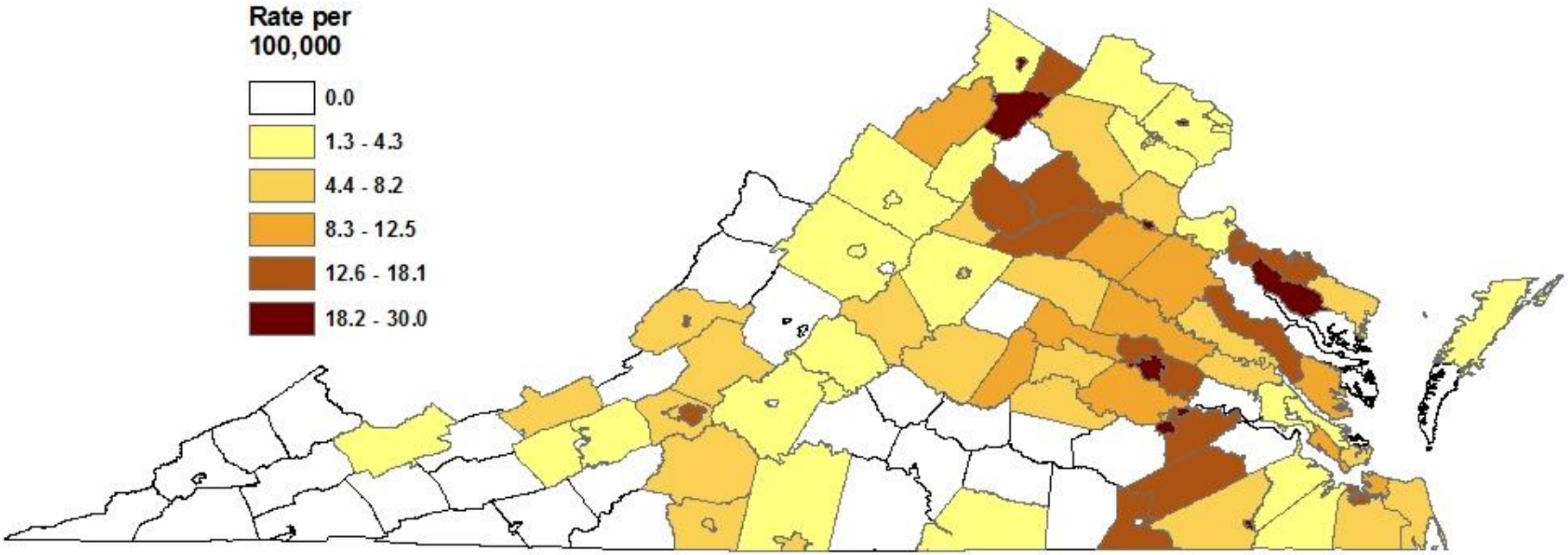

First Quarter, 2007-2017
Number of Fatalities
160
140
120
100
80
60
40
20
0
30 17 28 12 25 23 44 50 76 110 130
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Second Quarter, 2007-2017
Number of Fatalities
160
140
120
100
80
60
40
20
0
17 22 24 14 27 40 62 51 92 111 142
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Third Quarter, 2007-2017
Number of Fatalities
160
140
120
100
80
60
40
20
0
18 27 23 11 29 38 48 74 90 98 151
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*


Fourth Quarter, 2007-2017
Number of Fatalities
160
140
120
100
80
60
40
20
0
35 23 32 11 20 34 59 66 84 129 135
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017*

Rate of Fatal Heroin Overdoses by Locality of Overdose, 2017

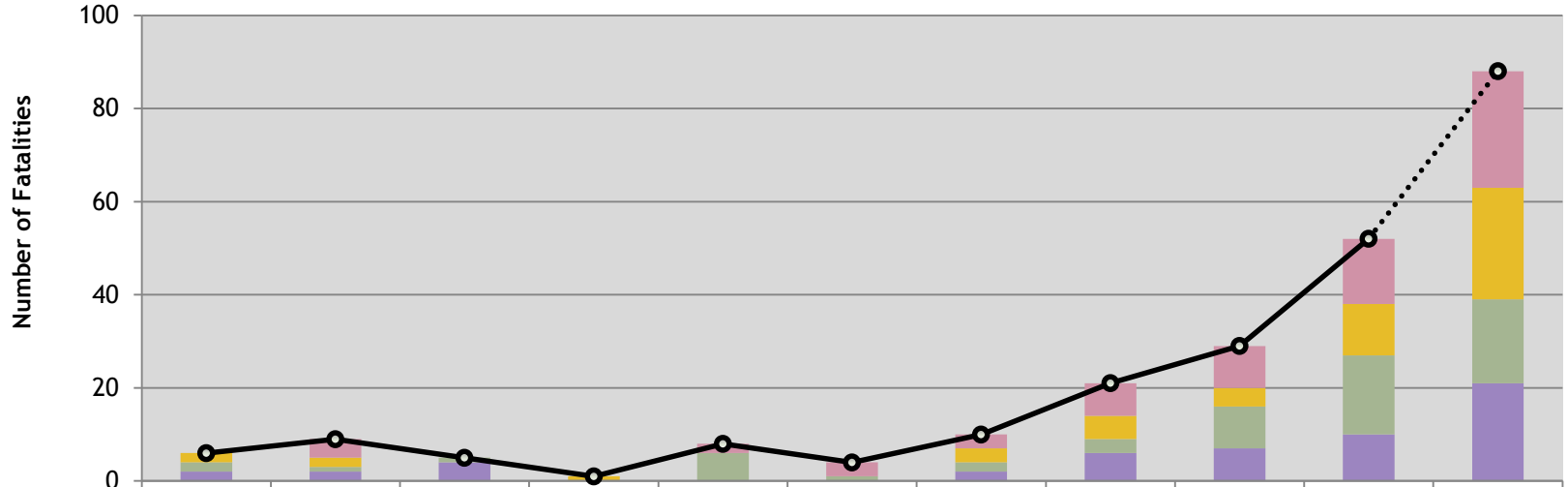


Source: Virginia Department of Health, Office of the Chief Medical Examiner

METHAMPHETAMINE

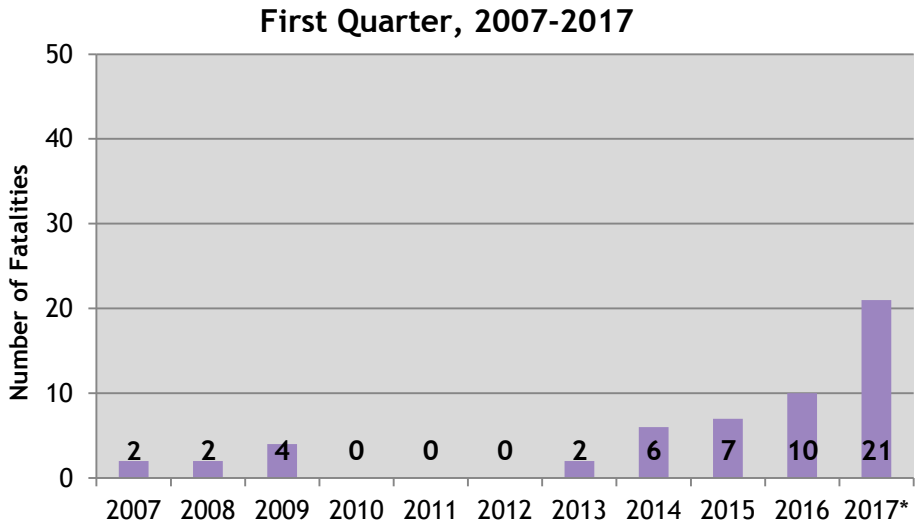
From 2007 to 2014, fatal methamphetamine overdoses were relatively uncommon compared to other drugs/drug categories. In 2014, the number of fatal methamphetamine overdoses began to increase. Over the 10 year time span (2007-2016), fatal methamphetamine overdoses most frequently had one or more prescription opioids (excluding fentanyl) causing or contributing to death (28.3%), fentanyl (Rx, illicit, and/or analogs) (17.9%), and/or heroin (14.5%). Fatal methamphetamine overdoses increased by 69.2% in 2017 when compared to 2016.

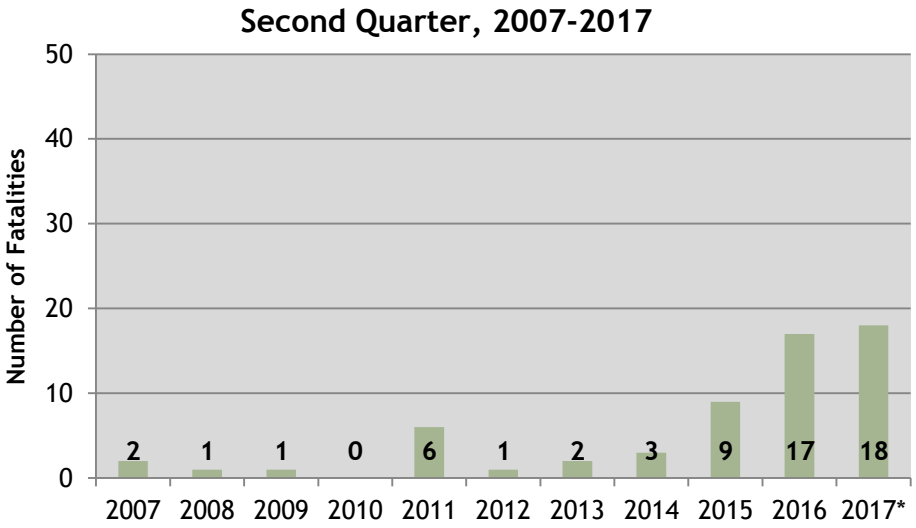
Total Number of Fatal Methamphetamine Overdoses by Quarter and Year of Death, 2007-2017
(‘Total Fatalities’ for 2017 is a Predicted Total for the Entire Year)

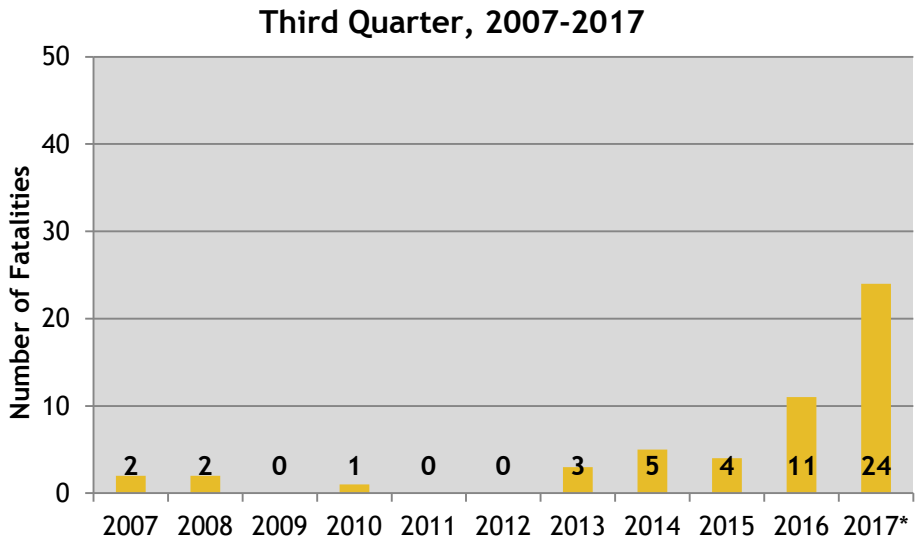


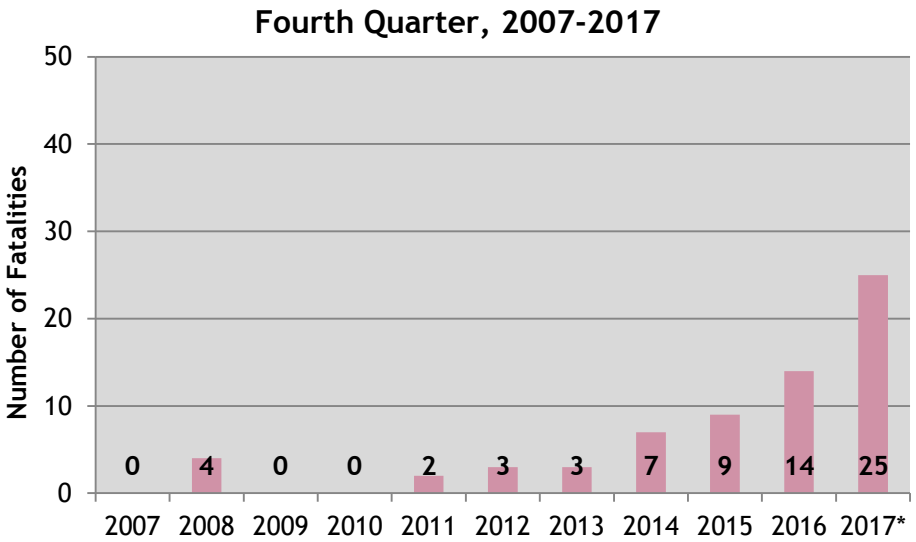
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Q4	0	4	0	0	2	3	3	7	9	14	25
Q3	2	2	0	1	0	0	3	5	4	11	24
Q2	2	1	1	0	6	1	2	3	9	17	18
Q1	2	2	4	0	0	0	2	6	7	10	21
Total Fatalities	6	9	5	1	8	4	10	21	29	52	88

METHAMPHETAMINE

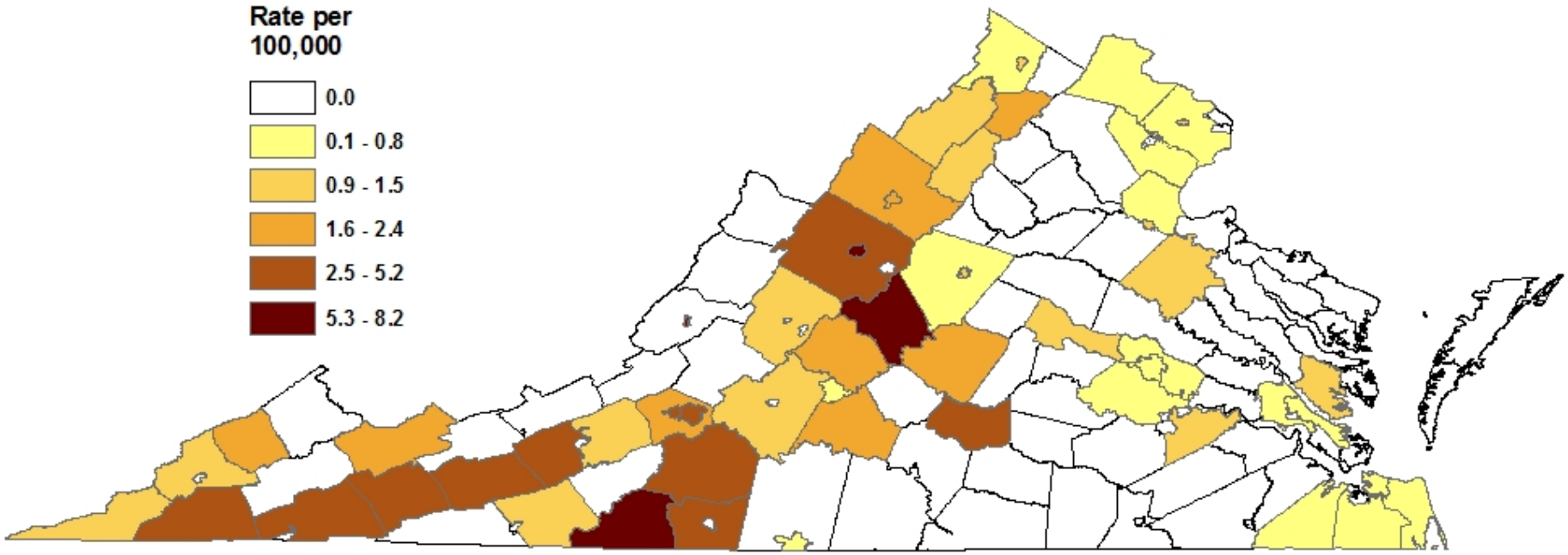








Rate of Fatal Methamphetamine Overdoses by Locality of Overdose, 2015-2017



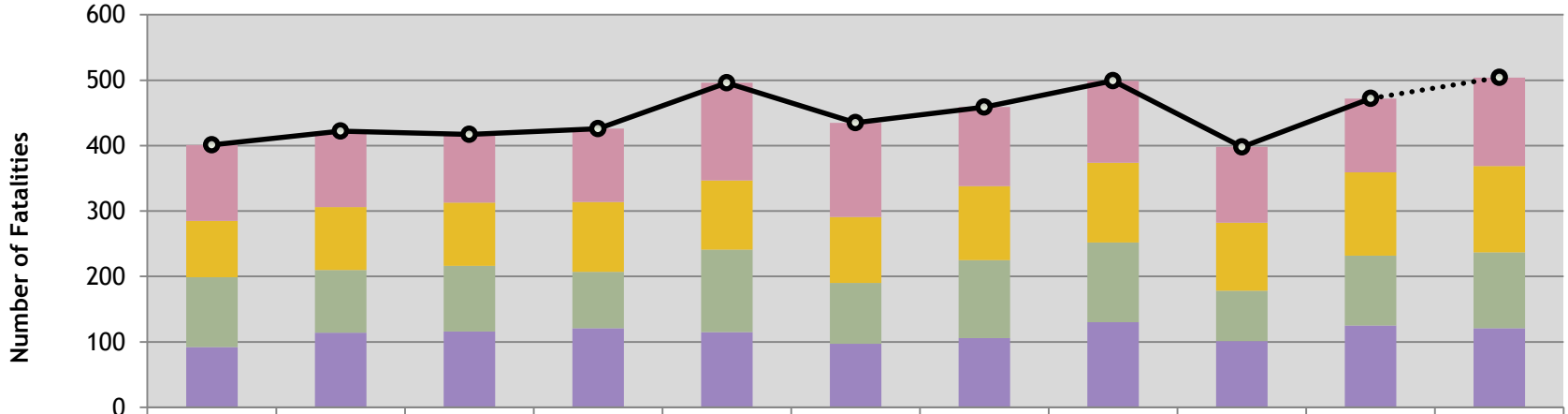
Source: Virginia Department of Health, Office of the Chief Medical Examiner

PRESCRIPTION OPIOIDS (EXCLUDING FENTANYL)

Since 2007, fatal prescription (Rx) opioid overdoses have been the leading category of drugs causing or contributing to death in the Commonwealth, with historically, oxycodone being the most common drug. Given the transition in fatal fentanyl overdoses from pharmaceutically produced fentanyl (2007-2014) to nearly all illicitly produced fentanyl (2015-present), fentanyl needs to be removed from the Rx opioid category and analyzed separately. This allows one to see the significant impact the drug is having on fatal overdose numbers in Virginia. By removing fentanyl from this Rx category, it is to be expected that Rx opioid fatalities from 2007-2013 to be slightly undercounted because true Rx fentanyl overdoses are excluded and combined with all 'fentanyl' to capture recent trends of illicit fentanyl in Virginia.

Total Number of Fatal Prescription Opioid Overdoses (Excluding Fentanyl) by Quarter and Year of Death, 2007-2017

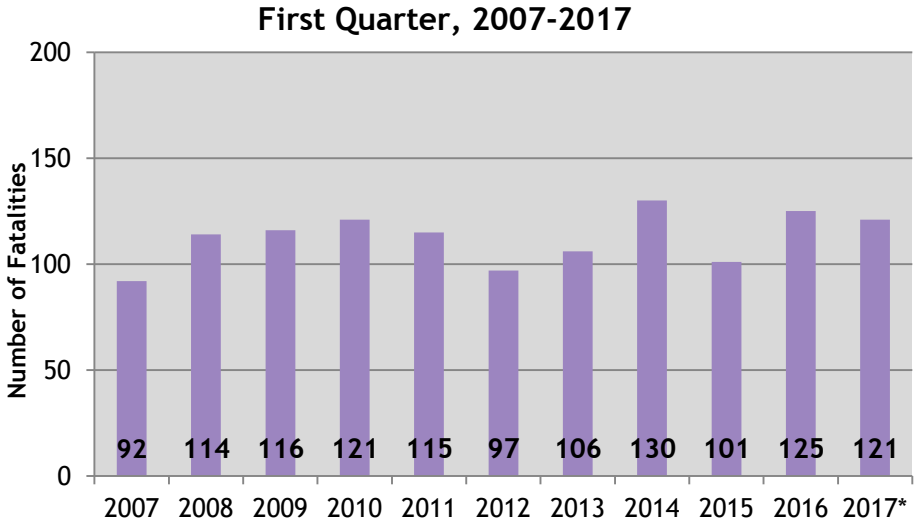
('Total Fatalities' for 2017 is a Predicted Total for the Entire Year)

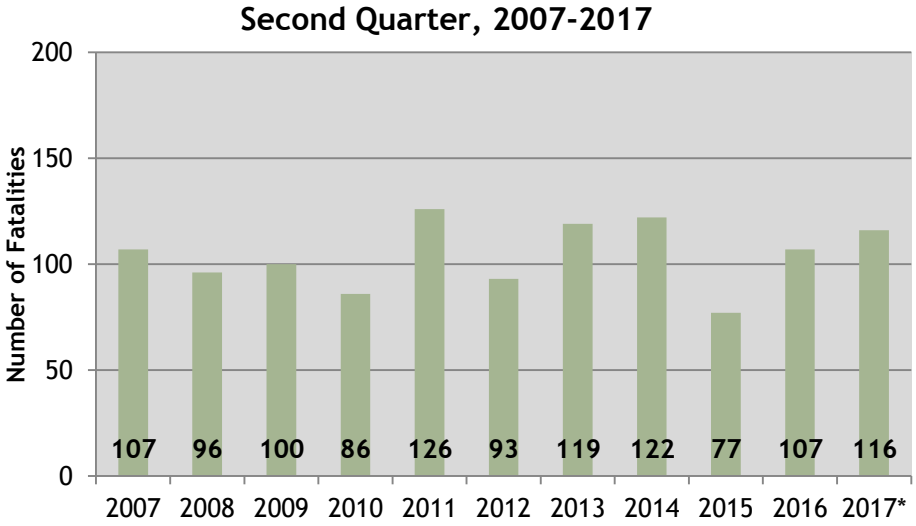


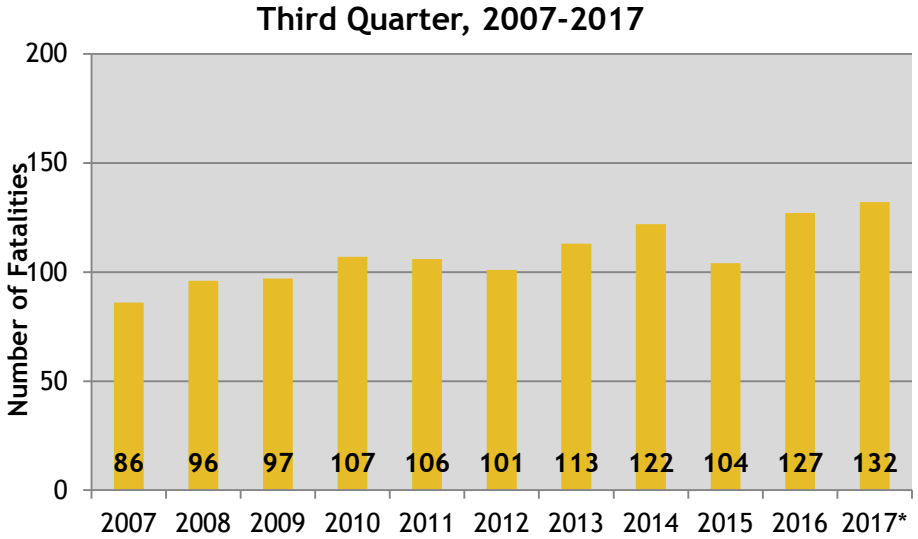
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Q4	116	116	104	112	149	144	121	125	116	113	135
Q3	86	96	97	107	106	101	113	122	104	127	132
Q2	107	96	100	86	126	93	119	122	77	107	116
Q1	92	114	116	121	115	97	106	130	101	125	121
Total Fatalities	401	422	417	426	496	435	459	499	398	472	504

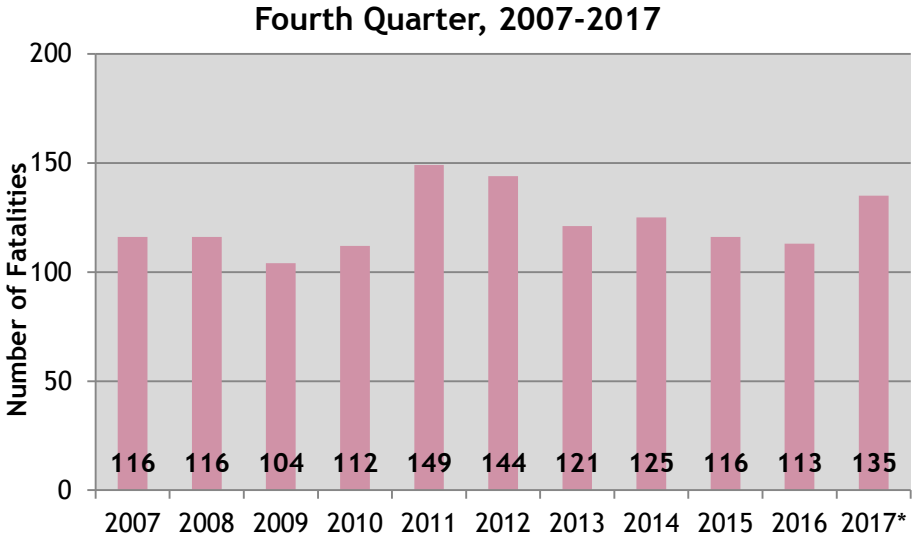
[1] 'Prescription Opioids (excluding fentanyl)' calculates all deaths in which one or more prescription opioids caused or contributed to death, but excludes fentanyl from the **required list** of prescription opioid drugs used to calculate the numbers. However, given that some of these deaths have multiple drugs on board, some deaths may have fentanyl in addition to other prescriptions opioids, and are therefore counted in the total number. Analysis must be done this way because by excluding all deaths in which fentanyl caused or contributed to death, the calculation would also exclude other prescription opioid deaths (oxycodone, methadone, etc.) from the analysis and would thereby undercount the actual number of fatalities due to these true prescription opioids.

PRESCRIPTION OPIOIDS (EXCLUDING FENTANYL)

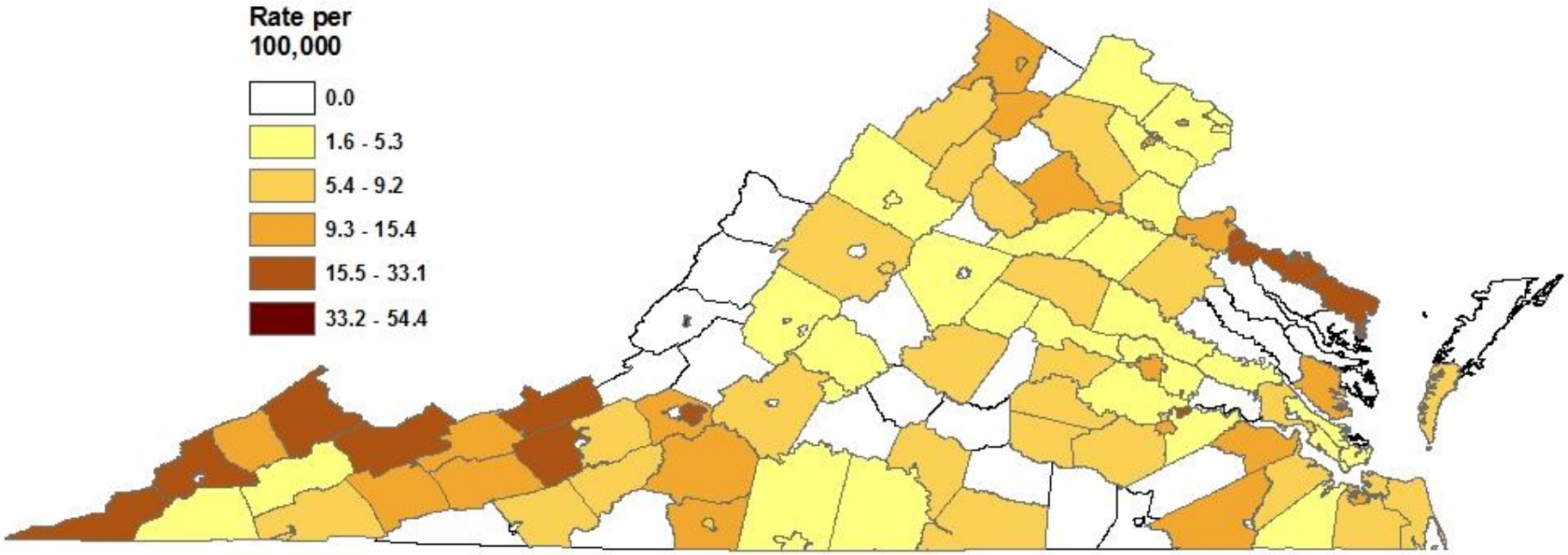








Rate of Fatal Prescription Opioid (Excluding Fentanyl) Overdoses by Locality of Overdose, 2017



Source: Virginia Department of Health, Office of the Chief Medical Examiner

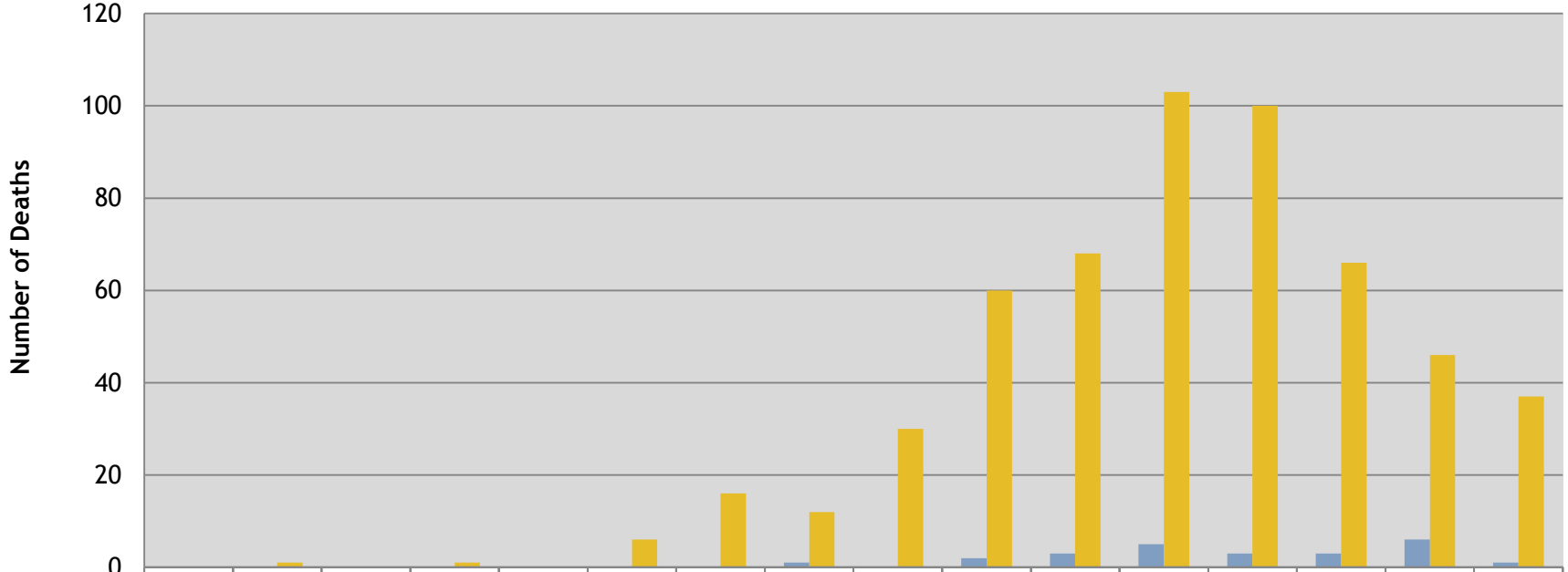
FATAL DRUG OVERDOSES OF SPECIAL INTEREST

- Synthetic Opioids and Fentanyl Analogs
- All Opioids (Fentanyl, Heroin, and/or Prescription Opioids)
- Heroin and/or Fentanyl

SYNTHETIC OPIOIDS AND FENTANYL ANALOGS

Synthetic opioids are a large group of chemically manufactured drugs typically used as narcotic analgesics (fentanyl, oxycodone, and methadone are examples of synthetic opioids), whereas opiates like heroin and morphine are made from opium poppy plants. Fentanyl analogs and U-47700, while different, are synthetic opioids that are made illegally. Novel synthetic opioids like fentanyl analogs and U-47700 need to be monitored because as state and federal efforts are continually being made to schedule novel drugs, drug traffickers are persistently trying to stay one step ahead of the law by synthesizing and introducing novel synthetic opioids into the drug market.

Total Number of Fatal Fentanyl Analog Overdoses by Quarter and Year of Death, 2014-2017



	2014 Q1	2014 Q2	2014 Q3	2014 Q4	2015 Q1	2015 Q2	2015 Q3	2015 Q4	2016 Q1	2016 Q2	2016 Q3	2016 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4
U-47700	0	0	0	0	0	0	0	1	0	2	3	5	3	3	6	1
Total Fentanyl Analog Fatalities	0	1	0	1	0	6	16	12	30	60	68	103	100	66	46	37

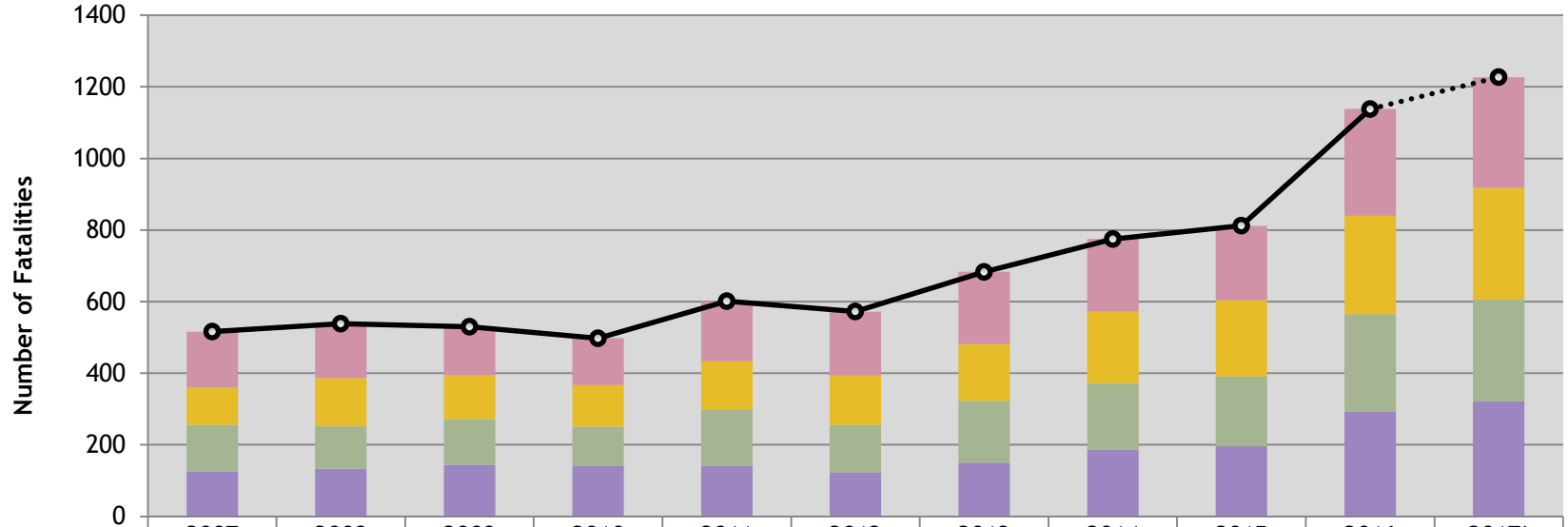
[1] Each fentanyl analog is tallied by each time it caused or contributed to death (analyzed from either toxicology or the cause of death statement) and therefore the total number of analogs will far exceed the actual number of fatalities

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

ALL OPIOIDS

From 2007-2015, opioids (fentanyl, heroin, U-47700, and/or one or more prescription opioids) made up approximately 75% of all fatal drug overdoses annually in Virginia. However, this percentage is increasing each year due to the significant increase in fatal fentanyl and/or heroin overdoses which began in late 2013 and early 2014. Fatal opioid overdoses increased by 7.8% in 2017 when compared to 2016.

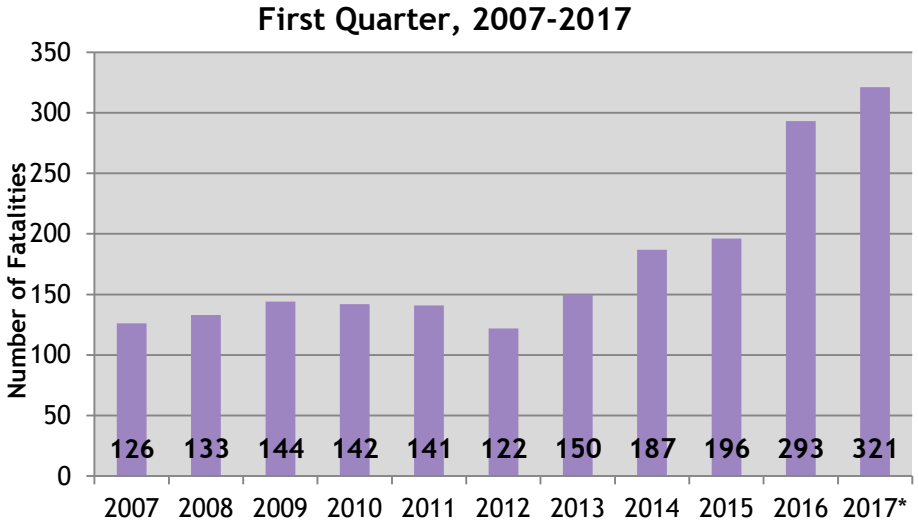
Total Number of Fatal Opioid Overdoses by Quarter and Year of Death, 2007-2017
('Total Fatalities' for 2017 is a Predicted Total for the Entire Year)

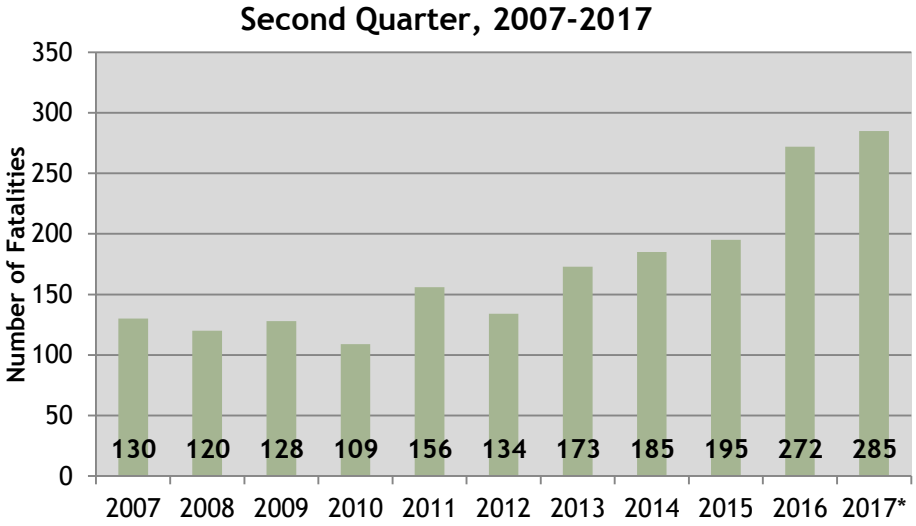


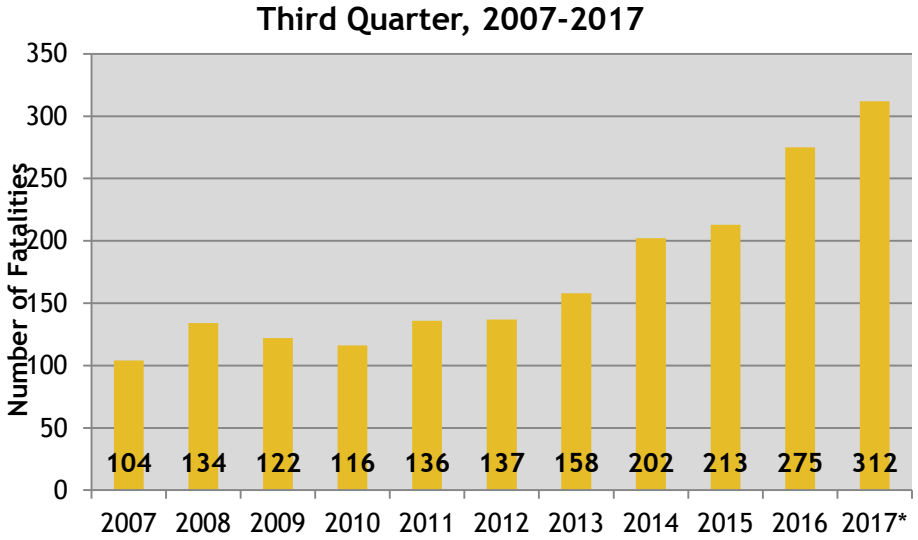
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Q4	156	151	136	131	168	179	202	201	208	298	309
Q3	104	134	122	116	136	137	158	202	213	275	312
Q2	130	120	128	109	156	134	173	185	195	272	285
Q1	126	133	144	142	141	122	150	187	196	293	321
Total Fatalities	516	538	530	498	601	572	683	775	812	1138	1227

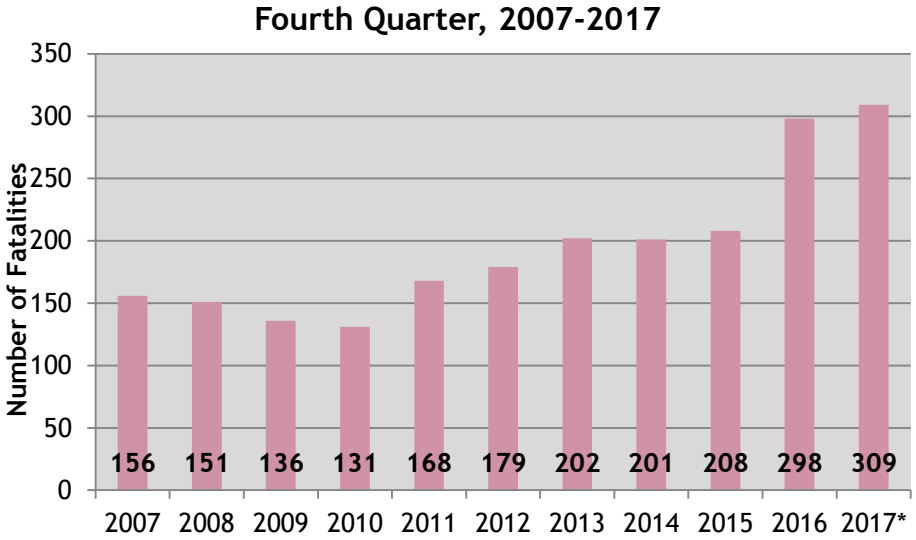
[1] 'All Opioids' include all versions of fentanyl, heroin, prescription opioids, U-47700, and opioids unspecified
[2] 'Opioids Unspecified' are a small category of deaths in which the determination of heroin and/or one or more prescription opioids cannot be made due to specific circumstances of the death. Most commonly, these circumstances are a result of death several days after an overdose, in which the OCME cannot test for toxicology because the substances have been metabolized out of the decedent's system.
[3] Fatal opioid numbers have changed slightly from past reports due to the removal of fentanyl from the category of prescription opioids, as well as the addition of buprenorphine, levorphanol, meperidine, pentazocine, propoxyphene, and tapentadol added to the list of prescription opioids.

ALL OPIOIDS









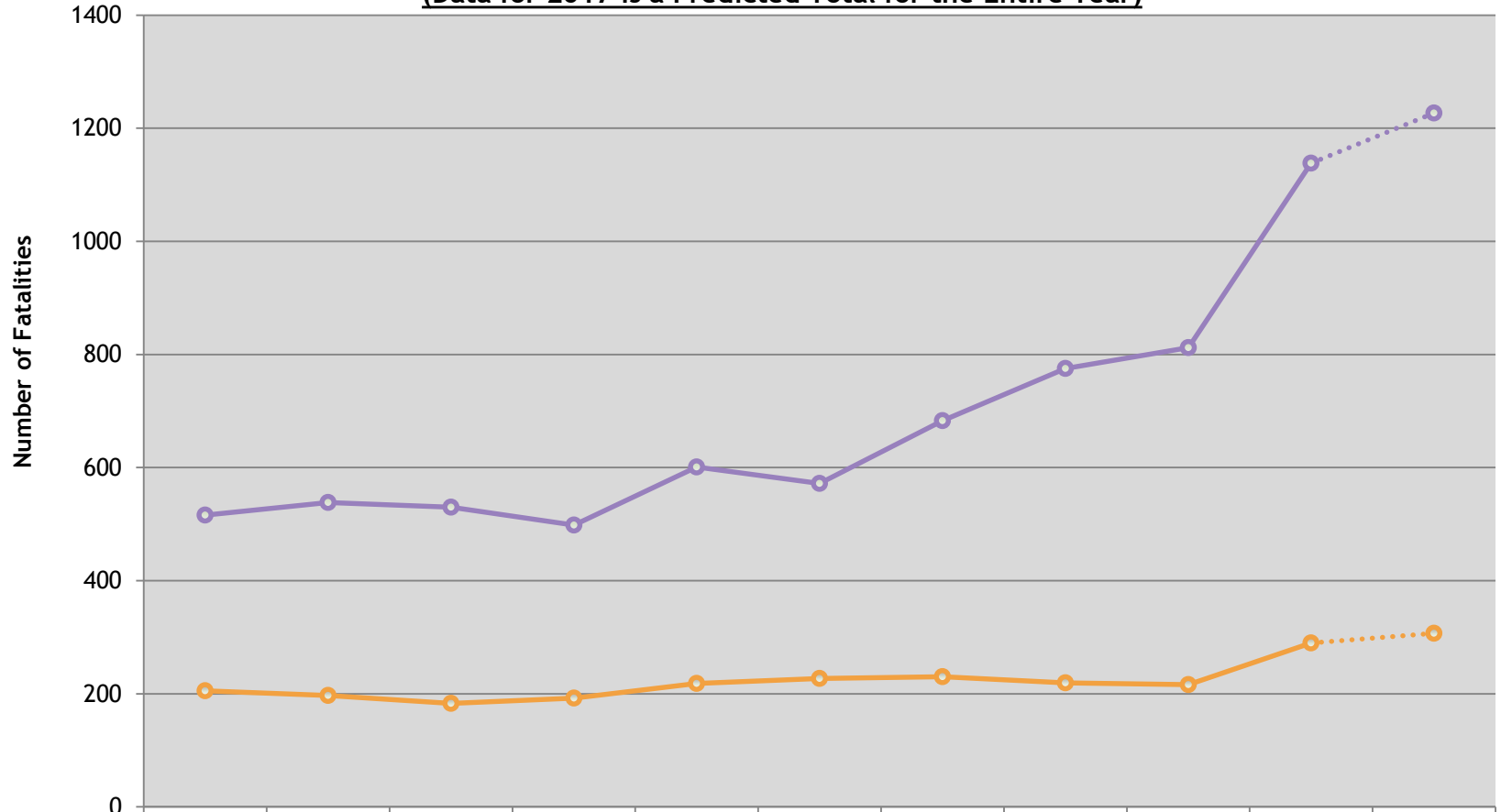
[1] 'All Opioids' include all versions of fentanyl, heroin, prescription opioids, U-47700, and opioids unspecified

[2] 'Opioids Unspecified' are a small category of deaths in which the determination of heroin and/or one or more prescription opioids cannot be made due to specific circumstances of the death. Most commonly, these circumstances are a result of death several days after an overdose, in which the OCME cannot test for toxicology because the substances have been metabolized out of the decedent's system.

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

OPIOIDS VS. NON-OPIOIDS

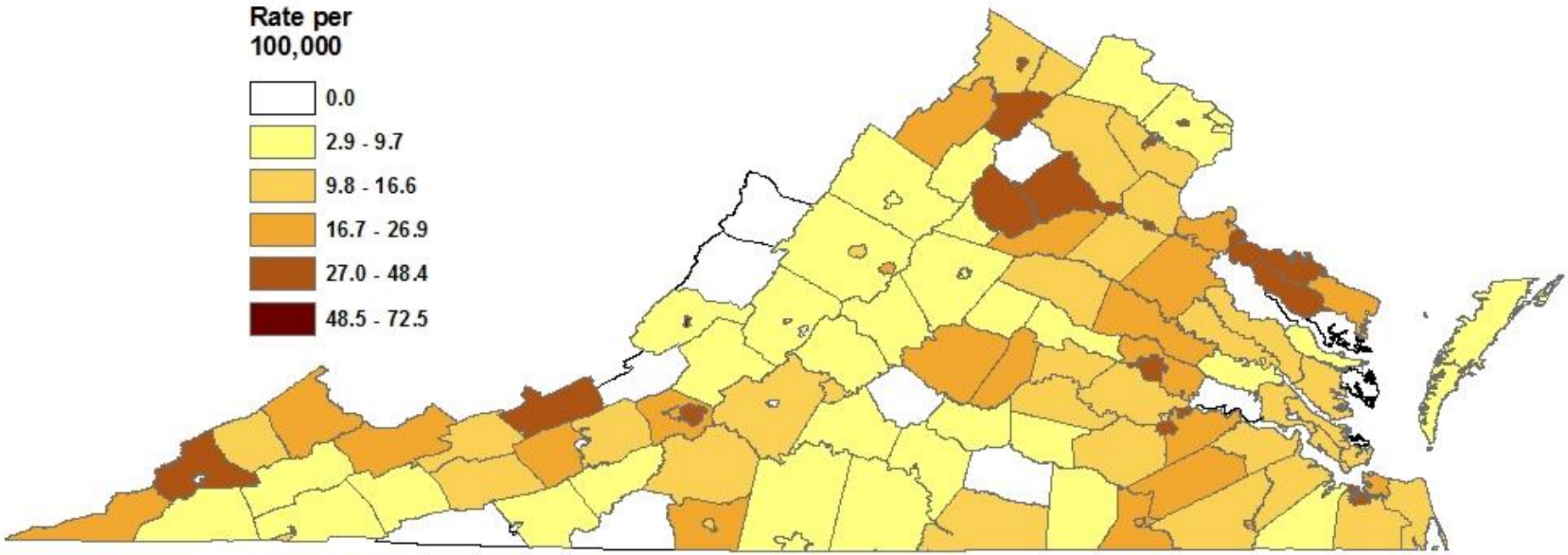
Total Number of Fatal Opioid Overdoses vs. Non-Opioid Overdoses by Year of Death, 2007-2017
(Data for 2017 is a Predicted Total for the Entire Year)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Opioids	516	538	530	498	601	572	683	775	812	1138	1227
Non-Opioids	205	197	183	192	218	227	230	219	216	290	307

[1] 'All Opioids' include all versions of fentanyl, heroin, prescription opioids, U-47700, and opioids unspecified
[2] 'Opioids Unspecified' are a small category of deaths in which the determination of heroin and/or one or more prescription opioids cannot be made due to specific circumstances of the death. Most commonly, these circumstances are a result of death several days after an overdose, in which the OCME cannot test for toxicology because the substances have been metabolized out of the decedent's system.

Rate of All Fatal Opioid Overdoses by Locality of Overdose, 2017

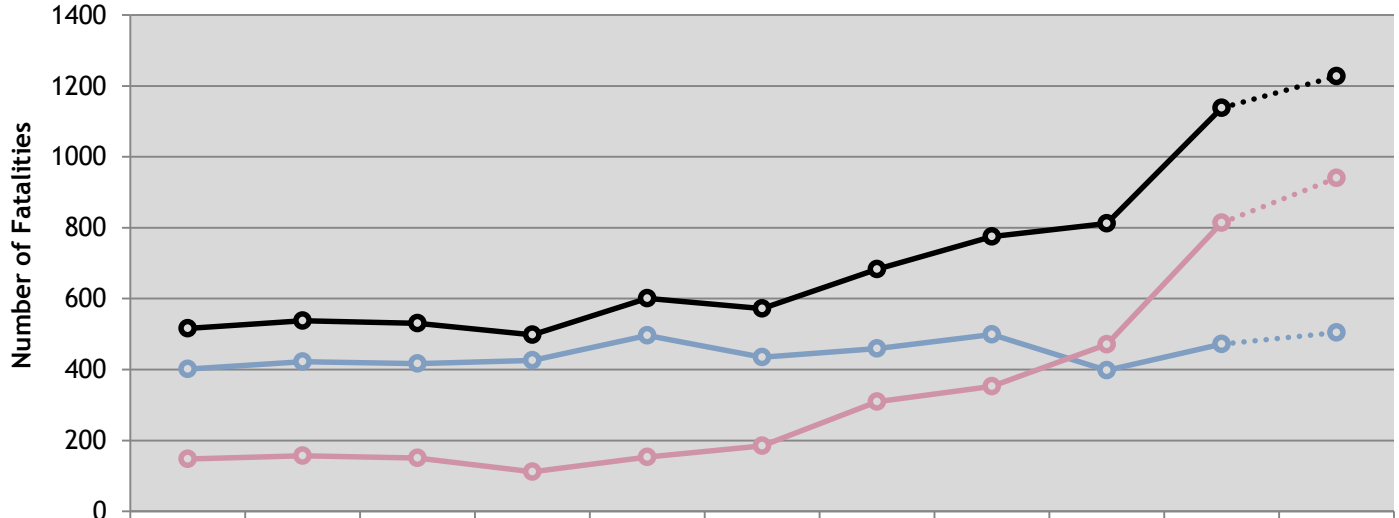


Source: Virginia Department of Health, Office of the Chief Medical Examiner

OPIOIDS- A DIFFERENT PERSPECTIVE

Prescription opioids are a group of drugs that are commercially made by pharmaceutical companies in certified laboratories that act upon the opioid receptors in the brain. Historically, fentanyl has been one of these drugs. However, in late 2013, early 2014, illicitly made fentanyl began showing up in Virginia and by 2016, most fatal fentanyl overdoses were of illicit production of the drug. Separating fentanyl from the grouping of prescription opioids for this reason demonstrates a slight decrease in fatal prescription opioid overdoses in 2015 and a dramatic increase in the number of fatal fentanyl and/or heroin overdoses. This has caused the significant rise in all fatal opioid overdoses in the Commonwealth since 2012.

Total Number of Prescription Opioid (Excluding Fentanyl), Fentanyl and/or Heroin, and All Opioid Overdoses by Year of Death, 2007-2017
('Total Fatalities' for 2017 is a Predicted Total for the Entire Year)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
All Opioids	516	538	530	498	601	572	683	775	812	1138	1227
Prescription Opioids (excluding fentanyl)	401	422	417	426	496	435	459	499	398	472	504
Fentanyl and/or Heroin	148	157	150	112	153	185	309	353	471	814	940

[1] 'All Opioids' include all versions of fentanyl, heroin, prescription opioids, and opioids unspecified

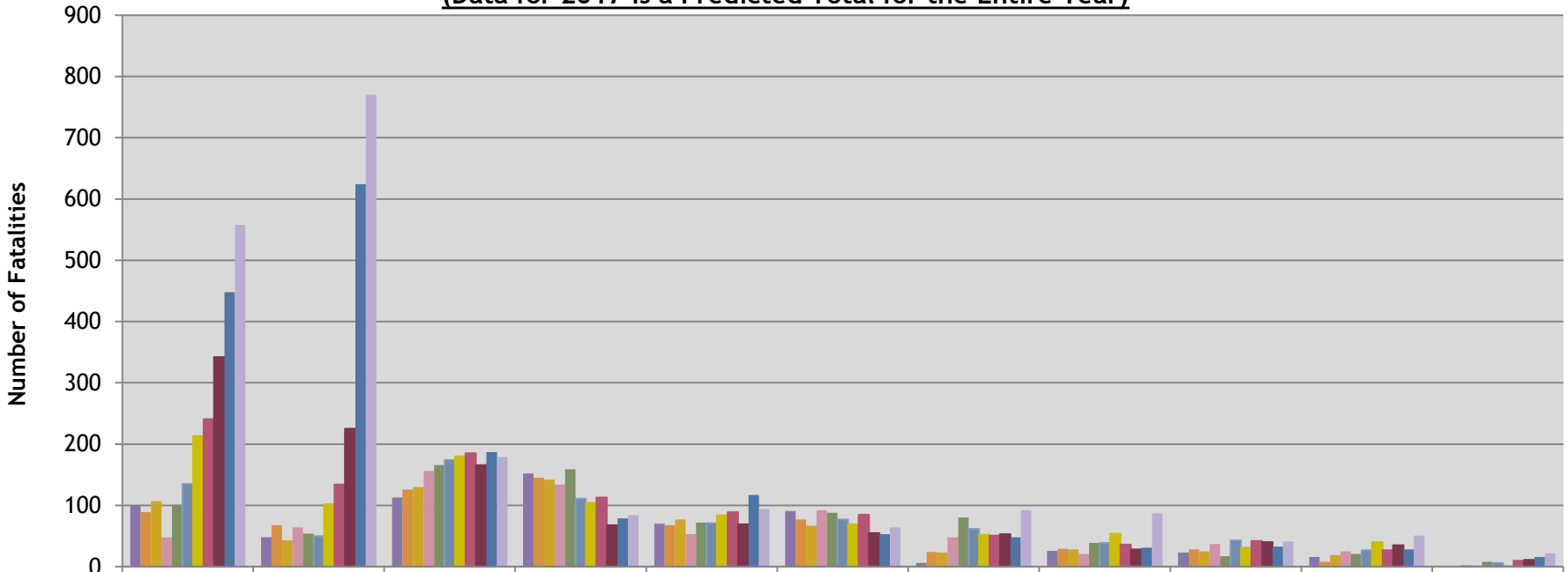
[2] Illicit and pharmaceutically produced fatal fentanyl overdoses are represented in this analysis. This includes all different types of fentanyl analogs (acetyl fentanyl, furanyl fentanyl, etc.)

[3] 'Prescription Opioids (excluding fentanyl)' calculates all deaths in which one or more prescription opioids caused or contributed to death, but excludes fentanyl from the **required list** of prescription opioid drugs used to calculate the numbers. However, given that some of these deaths have multiple drugs on board, some deaths may have fentanyl in addition to other prescriptions opioids, and are therefore counted in the total number. Analysis must be done this way because by excluding all deaths in which fentanyl caused or contributed to death, the calculation would also exclude other prescription opioid deaths (oxycodone, methadone, etc.) from the analysis and would thereby undercount the actual number of fatalities due to these true prescription opioids.

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

ALL OPIOIDS

Total Number of Fatal Opioid Overdoses by Drug Name and Year of Death, 2007-2017
(Data for 2017 is a Predicted Total for the Entire Year)



	Heroin	Fentanyl	Oxycodone	Methadone	Morphine	Hydrocodone	Oxymorphone	Codeine	Tramadol	Hydromorphone	Buprenorphine
2007	100	48	113	152	70	91	6	26	23	16	1
2008	89	68	126	145	68	77	24	29	28	8	1
2009	107	43	130	142	77	67	23	28	25	19	3
2010	48	64	156	134	53	92	48	21	37	25	2
2011	101	54	166	159	72	88	80	39	17	21	8
2012	135	50	174	111	71	77	62	39	43	27	6
2013	213	102	180	104	84	69	52	54	31	40	1
2014	241	134	185	113	89	85	51	36	42	27	10
2015	342	225	166	68	69	55	53	28	40	35	11
2016	448	624	187	79	117	53	48	31	33	28	16
2017*	558	770	179	84	94	64	92	87	41	51	22

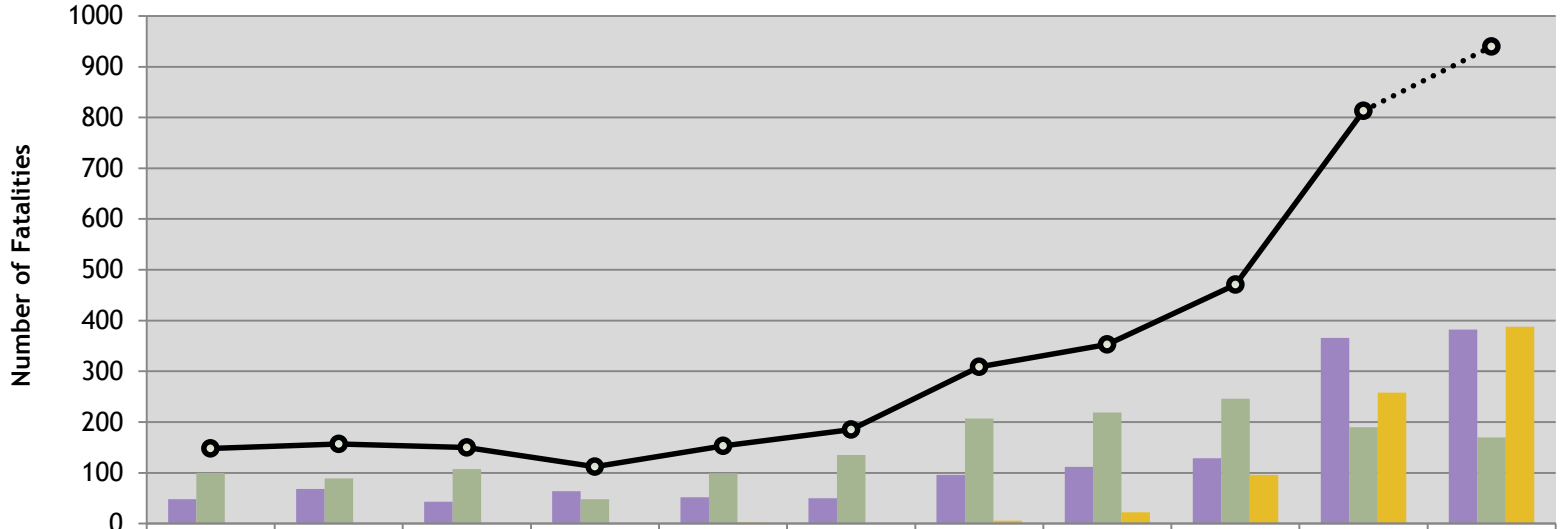
[1] Illicit and pharmaceutically produced fatal fentanyl overdoses are represented in this analysis. This includes all different types of fentanyl analogs (acetyl fentanyl, furanyl fentanyl, etc.)

[2] Levorphanol, meperidine, pentazocine, propoxyphene, and tapentadol were excluded from this analysis due low annual case counts (<20 deaths)

FENTANYL AND/OR HEROIN

The total number of fatal fentanyl and/or heroin overdoses have significantly increased since late 2012. It is important to look at these two drugs together because as heroin became more popular in 2010, fentanyl occasionally began showing up as an additive to the heroin. By late 2013 and early 2014, some heroin being sold on the street was actually completely fentanyl, unbeknownst to the user. It is essential to look at these fentanyl (no heroin), heroin (no fentanyl), and fentanyl and heroin combination deaths together because users never know exactly what is in the illegal drugs purchased off the streets. Fatal fentanyl and/or heroin overdoses increased by 15.6% in 2017 when compared to 2016.

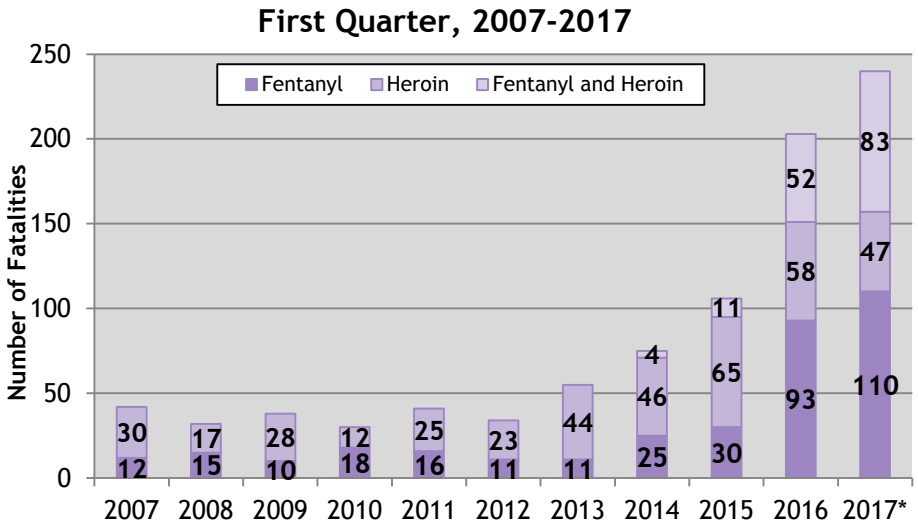
Total Number of Fatal Fentanyl and/or Heroin Overdoses by Year of Death, 2007-2017
(‘Total Fatalities’ for 2017 is a Predicted Total for the Entire Year)

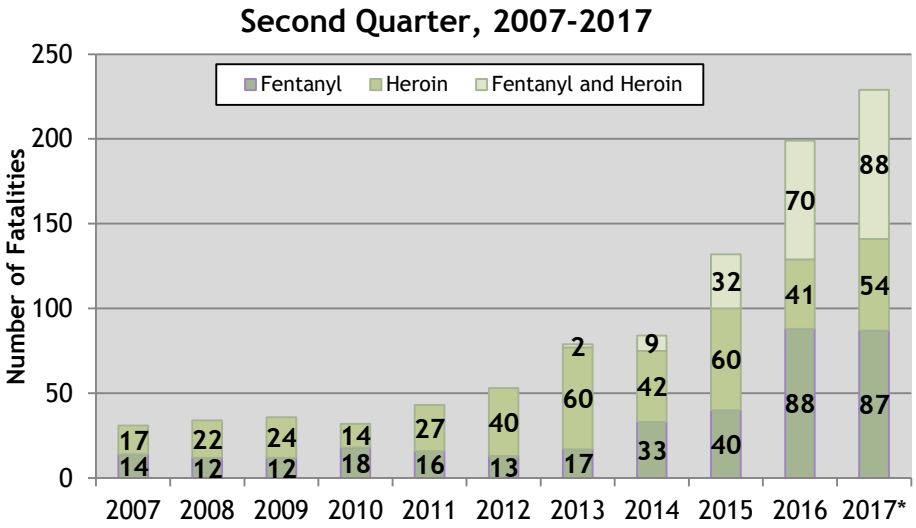


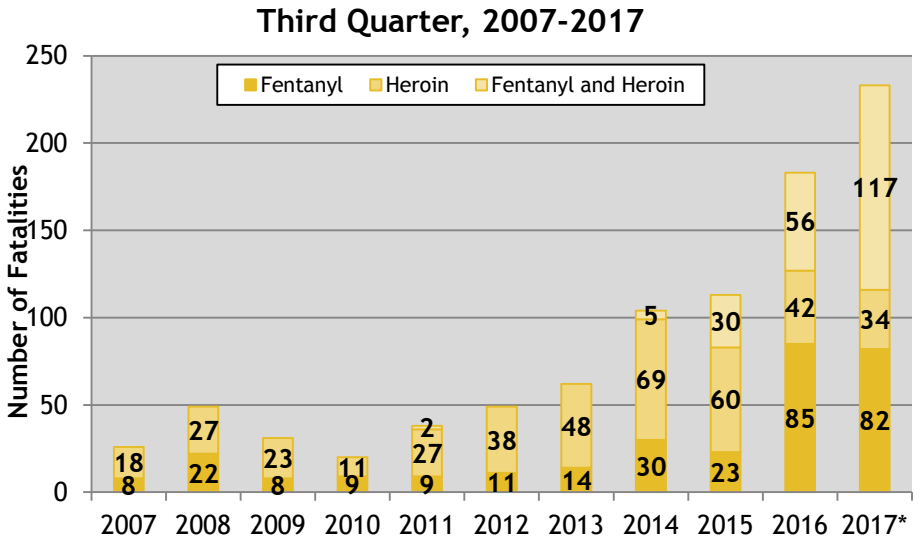
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Fentanyl (No Heroin)	48	68	43	64	52	50	96	112	129	366	382
Heroin (No Fentanyl)	100	89	107	48	99	135	207	219	246	190	170
Fentanyl and Heroin	0	0	0	0	2	0	6	22	96	258	388
Total Fatalities	148	157	150	112	153	185	309	353	471	813	940

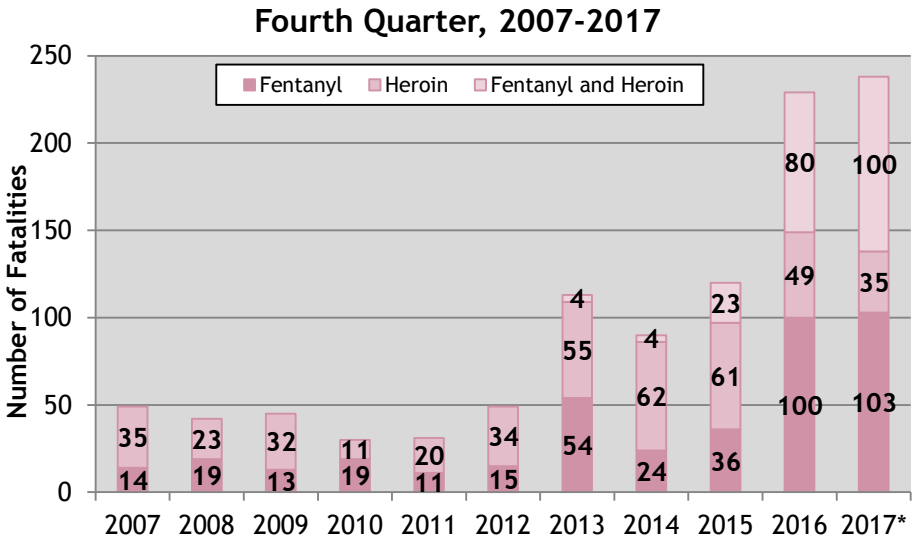
[1] Illicit and pharmaceutically produced fatal fentanyl overdoses are represented in this analysis. This includes all different types of fentanyl analogs (acetyl fentanyl, furanyl fentanyl, etc.)

FENTANYL AND/OR HEROIN



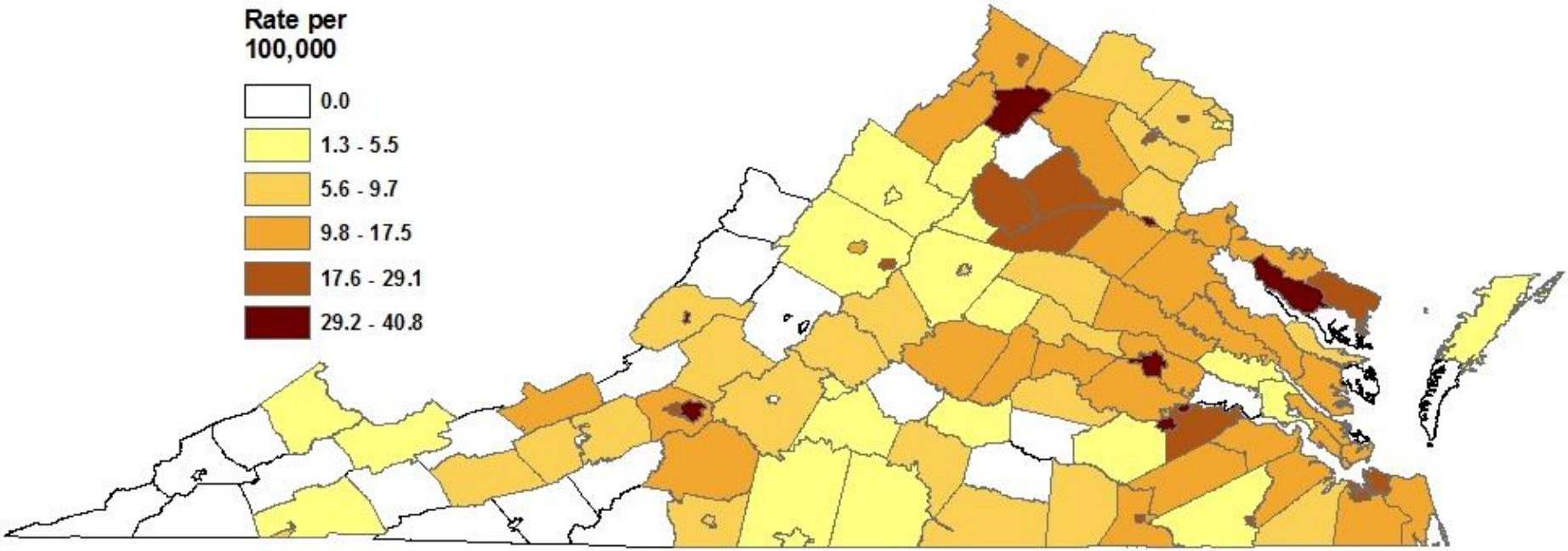






VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

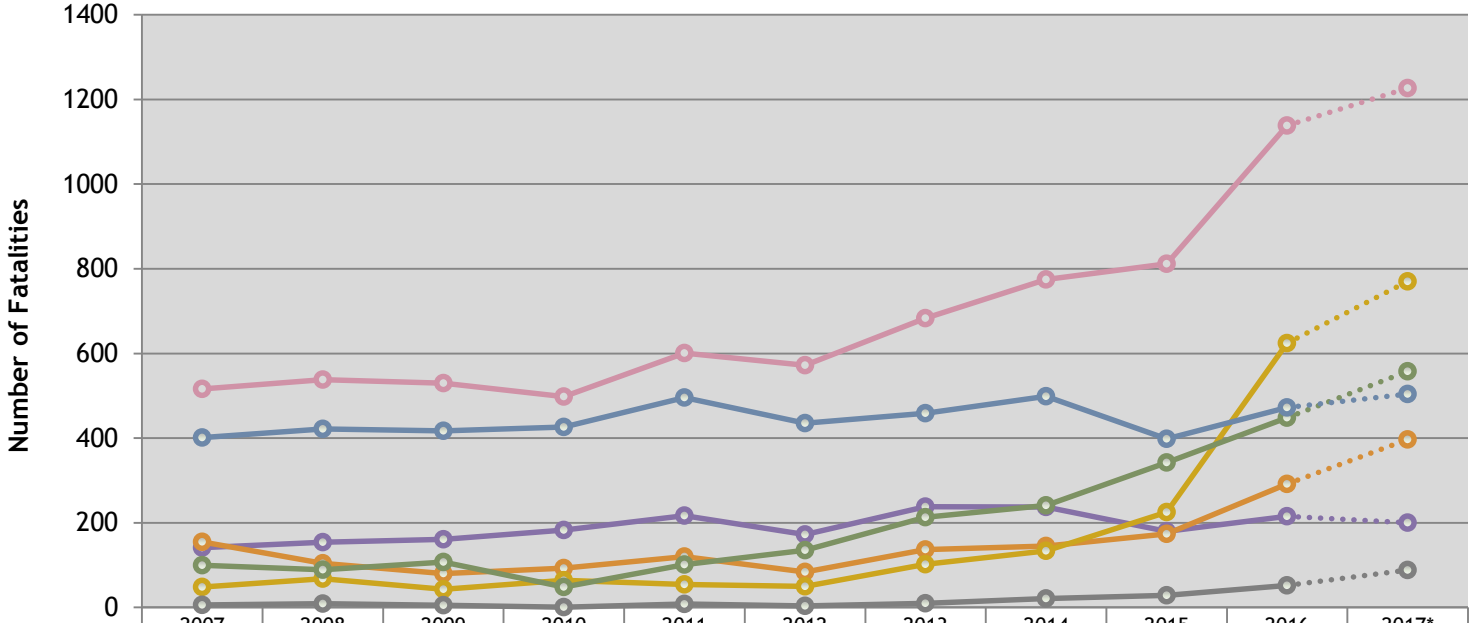
Rate of Fatal Fentanyl (Rx, Illicit, or Analogs) and/or Heroin Overdoses by Locality of Overdose, 2017



Source: Virginia Department of Health, Office of the Chief Medical Examiner

ALL DRUGS

Total Number of Fatal Drug Overdoses Drug Name/Category and Year of Death, 2007-2017
(‘Total Fatalities’ for 2017 is a Predicted Total for the Entire Year)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017*
Benzodiazepines	141	154	161	183	217	172	238	237	180	215	200
Cocaine	155	104	80	93	120	84	137	145	174	292	397
Fentanyl	48	68	43	64	54	50	102	134	225	624	770
Heroin	100	89	107	48	101	135	213	241	342	448	558
Methamphetamine	6	9	5	1	8	4	10	21	29	52	88
Prescription Opioids (excluding Fentanyl)	401	422	417	426	496	435	459	499	398	472	504
All Opioids	516	538	530	498	601	572	683	775	812	1138	1227

[1] Deaths may be represented in more than one category due to groupings of drug categories (e.g. heroin)
[2] ‘All Opioids’ includes all versions of fentanyl, heroin, prescription opioids, U-47700, and opioids unspecified
[3] ‘Opioids Unspecified’ are a small category of deaths in which the determination of heroin and/or one or more prescription opioids cannot be made due to specific circumstances of the death. Most commonly, these circumstances are a result of death several days after an overdose, in which the OCME cannot test for toxicology because the substances have been metabolized out of the decedent’s system.
[4] Historically, fentanyl has been categorized as a prescription opioid because it is mass produced by pharmaceutical companies. However, recent law enforcement investigations and toxicology results have demonstrated that several recent fentanyl seizures have ***not*** been pharmaceutically produced, but illicitly produced. This illicit form of fentanyl is produced by international drug traffickers who import the drug into the United States and often, mix it into heroin being sold. This illicitly produced fentanyl has been the biggest contributor to the significant increase in the number of fatal opioid overdoses in Virginia.
[5] Illicit and pharmaceutically produced fatal fentanyl overdoses are represented in this analysis. This includes all different types of fentanyl analogs (acetyl fentanyl, furanyl fentanyl, etc.)

CONTACT INFORMATION

This report is compiled by the Virginia Department of Health, Office of the Chief Medical Examiner. For additional information regarding these or other statistics, please contact:

Kathrin "Rosie" Hobron, MPH

Statewide Forensic Epidemiologist

Virginia Department of Health

Office of the Chief Medical Examiner

804-786-6063

kathrin.hobron@vdh.virginia.gov

http://www.vdh.state.va.us/medexam/