Modifiable Contributing Factors of Drug Overdose Deaths

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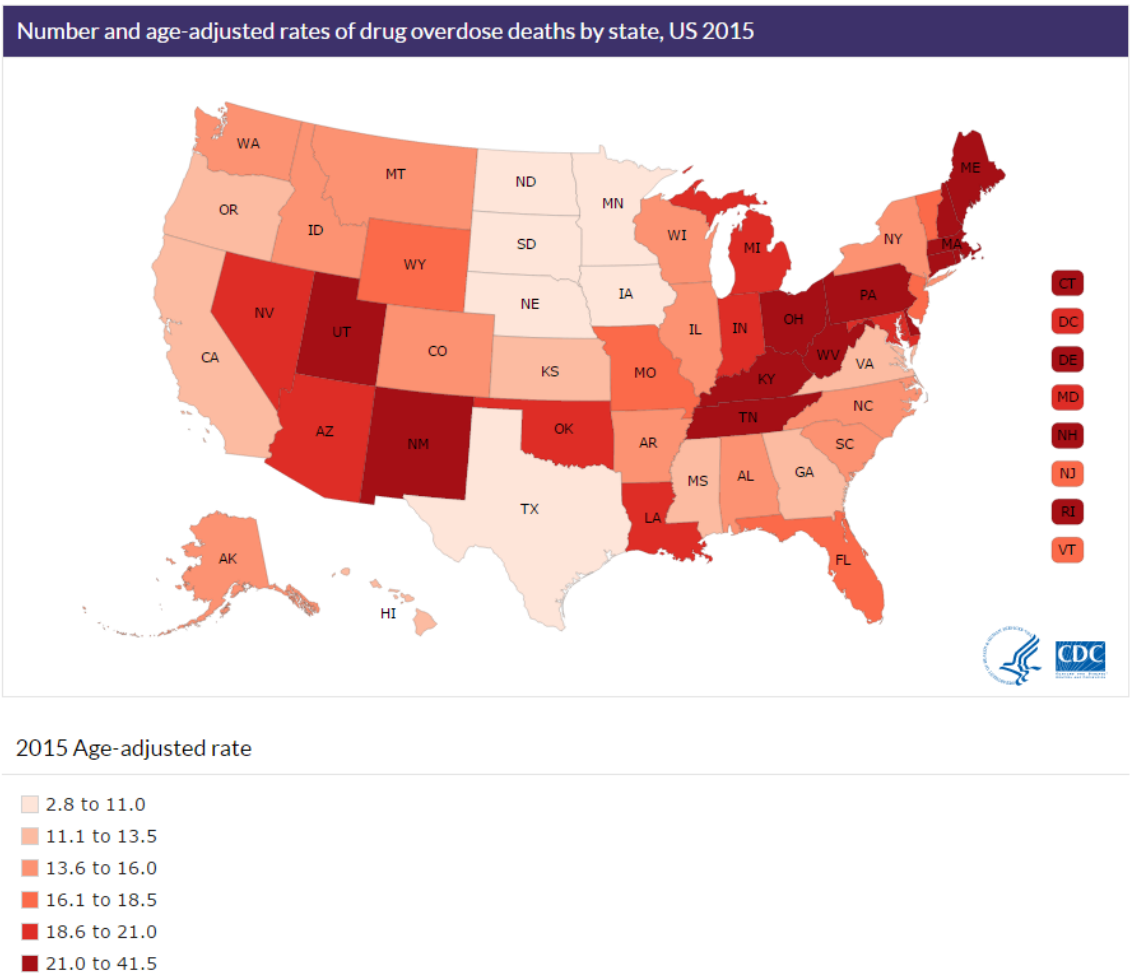
EXECUTIVE SUMMARY:

Kentucky has a culture of poor health, especially as it relates to the opioid epidemic and drug overdose deaths. To begin the shift from a culture of poor health to a culture of good health, modifiable contributing factors need to be brought to the forefront with greater understanding. Drug overdose deaths are increasing nationwide and Kentucky is one of the heaviest affected states (Figure 1)[1]. In order to better understand the factors contributing to these climbing rates, this project assessed county level data to determine what factors were significant risk and/or protective factors. These variables were further researched and evidence-based interventions were compiled to address each factor. This project will serve as a resource for communities that struggle with drug overdose deaths to determine what intervention may be successful in their communities.

Figure 1:

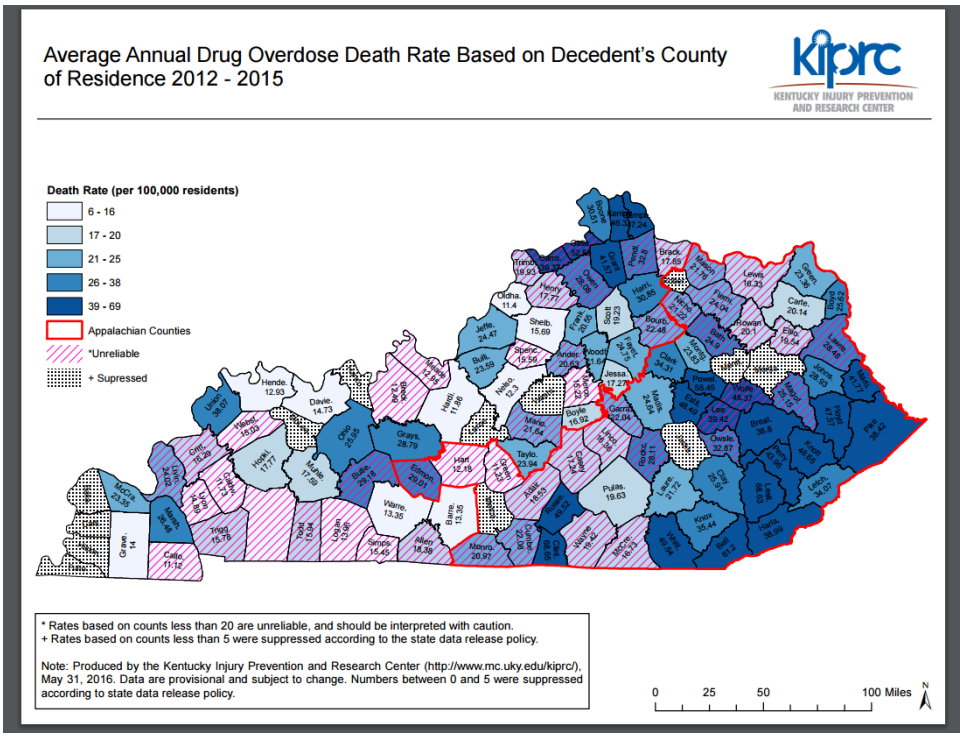


INTRODUCTION/BACKGROUND:

A culture of health is broadly defined as one in which good health and well-being flourish across geographic, demographic, and social sectors; fostering healthy equitable communities guides public and private decision making; and everyone has the opportunity to make choices that lead to healthy lifestyles[2]. Culture of health covers a broad area and emphasizes how many characteristics of the socio-political and physical environments can impact health. Opioid addiction has become a major epidemic in the state of Kentucky and in many other states, particularly those in Appalachia. Factors included in the umbrella term "culture of health" could be influencing overdose death rates in many areas of the state, and this project sought to identify those factors. The project focuses on overdose death rates and contributing factors at the county level. The project functions on the belief that actionable county-level data would be the most efficient means of addressing overdose death rates. If the factors that are increasing overdose death rates are identified, then community stakeholders and policy makers could potentially address these factors in their community.

At the suggestion of this project's mentor, the team met with staff members from the Kentucky Injury Prevention and Research Center (KIPRC), to discuss what data related to the issue was already available at the county level. KIPRC had been compiling and analyzing data for many years related to overdose deaths and drug-related hospitalizations. The rates remain disproportionate across the state (Figure 2)[3]. This meeting helped refine the goals of the project and helped identify possible variables to explore in more detail.

Figure 2:



Combining the idea of a culture of health and the opioid epidemic led to this final project. A total of 1,218 people died of drug overdoses in Kentucky in 2015, up from 1,069 in 2014[4]. The issue continues to grow and has garnered a great deal of attention. Many communities are trying to address overdose deaths, but the problem is multifaceted and the state is very diverse. What works for one community may not work for all. In an effort to help small communities and the state as a whole, the project sought to identify modifiable risk factors for drug overdose deaths that could be directly addressed through evidence-based practices.

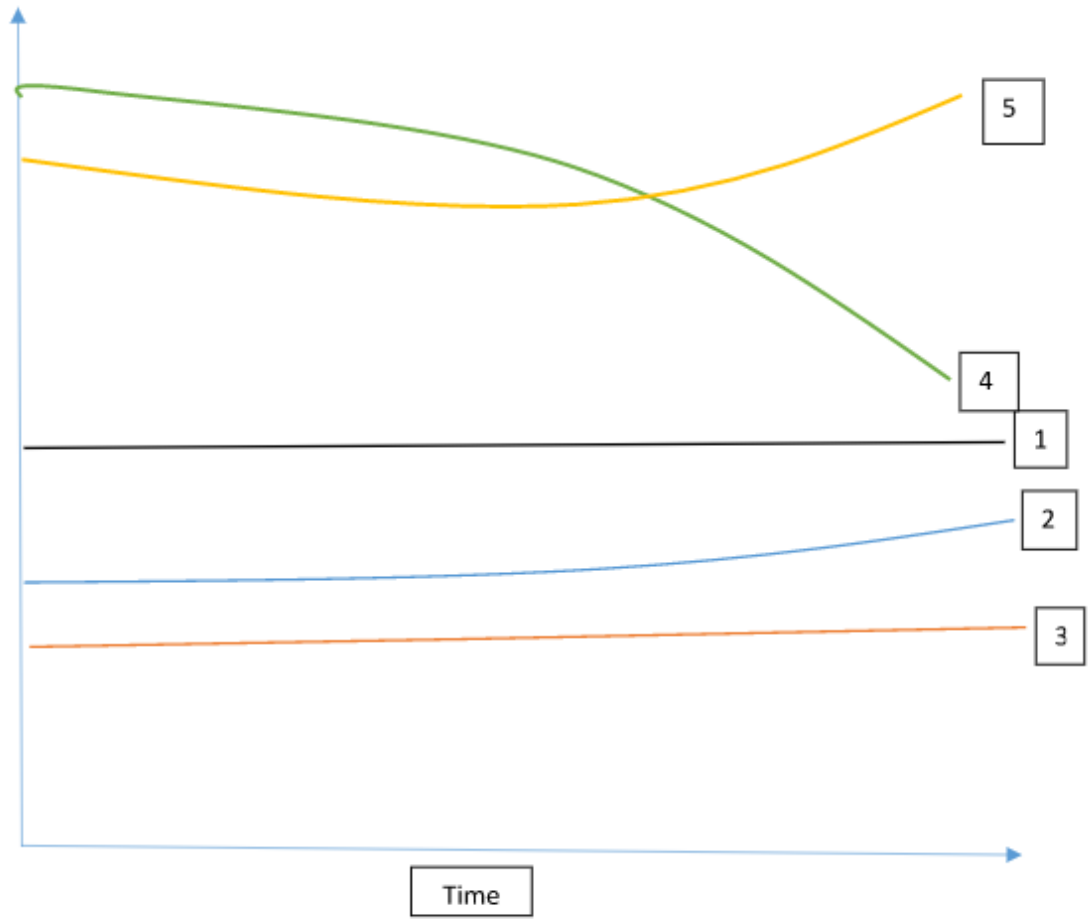
Problem Statement:

We aim to assess protective and contributing factors that are associated with drug overdose deaths in Kentucky.

Behavior Over Time Graph:

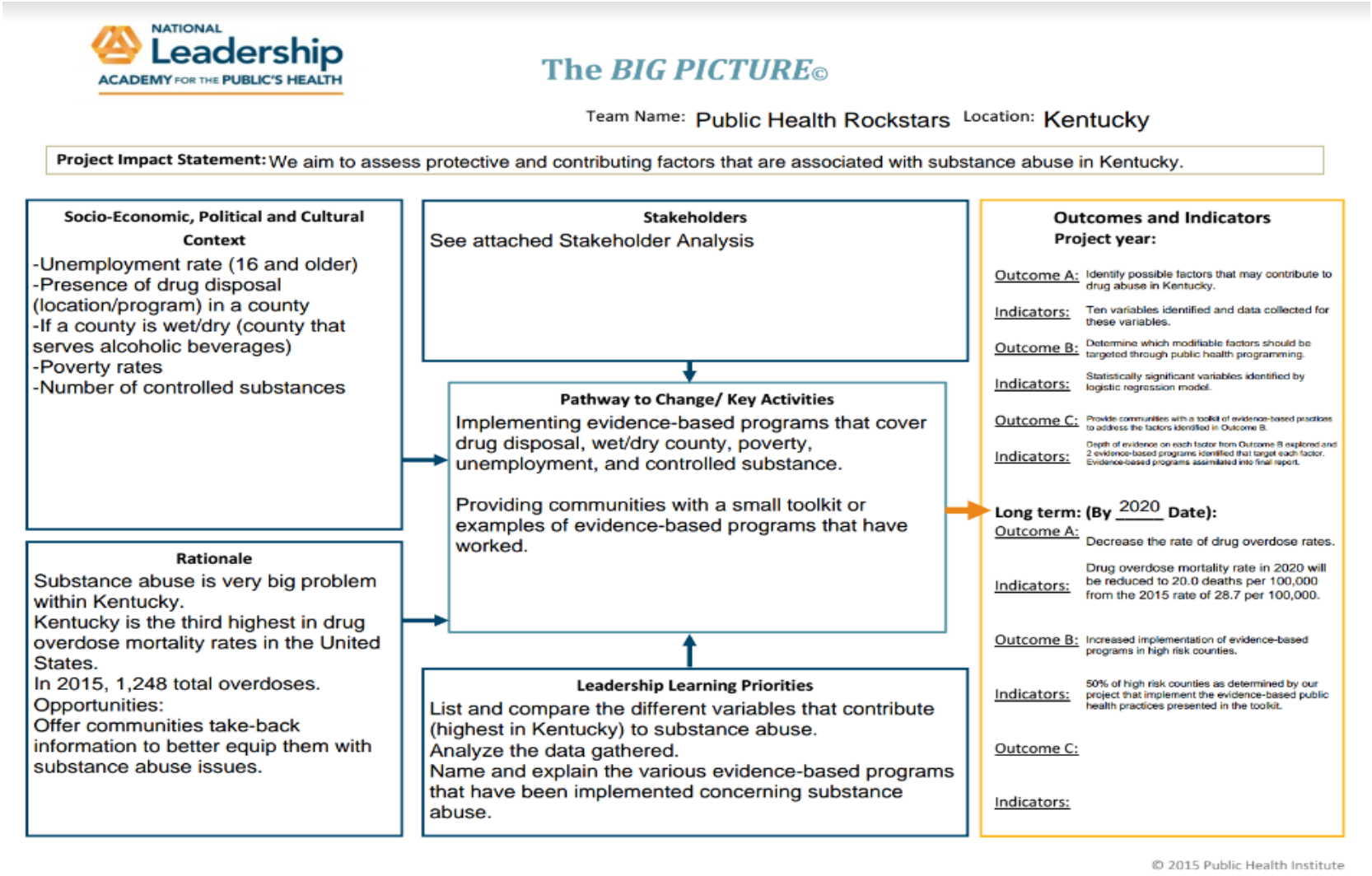
In considering the current opioid epidemic and increasing drug overdose death rates, the team created a graph displaying how behaviors relating to this problem have changed or are expected to change over time. A description of each is found below.

1. Understanding of the problem – While it is common knowledge that drug overdose deaths are increasing, many due to opioids, true understanding of the entire problem remains stagnant.
2. Openness to treatment – The team believed that over time, those that abuse drugs will become more open to the idea of treatment. This could be attributable to the negative effects of drug abuse on their lives, as well as increased knowledge of treatment options.
3. Resources to help those with problems – The team perceived a very slight increase over time in resources to help those with substance abuse. The current political and social climates remain uncompassionate towards those with substance abuse issues. The fact that these deaths continue to rise helps make it more evident that something must be done, but hope for additional resources for a population that is struggling remains low.
4. Availability of drugs – Over time, drug availability will decrease drastically. Police task forces, prescription drug monitoring programs, and drug disposal locations will aid in decreasing availability of current drugs of abuse. However, this also will lead to number five, the creation/evolution of new substances of abuse.
5. Creation/Evolution of new substances of abuse – It is inevitable that as the commonly abused drugs decrease in availability, something else will rise to take its place.

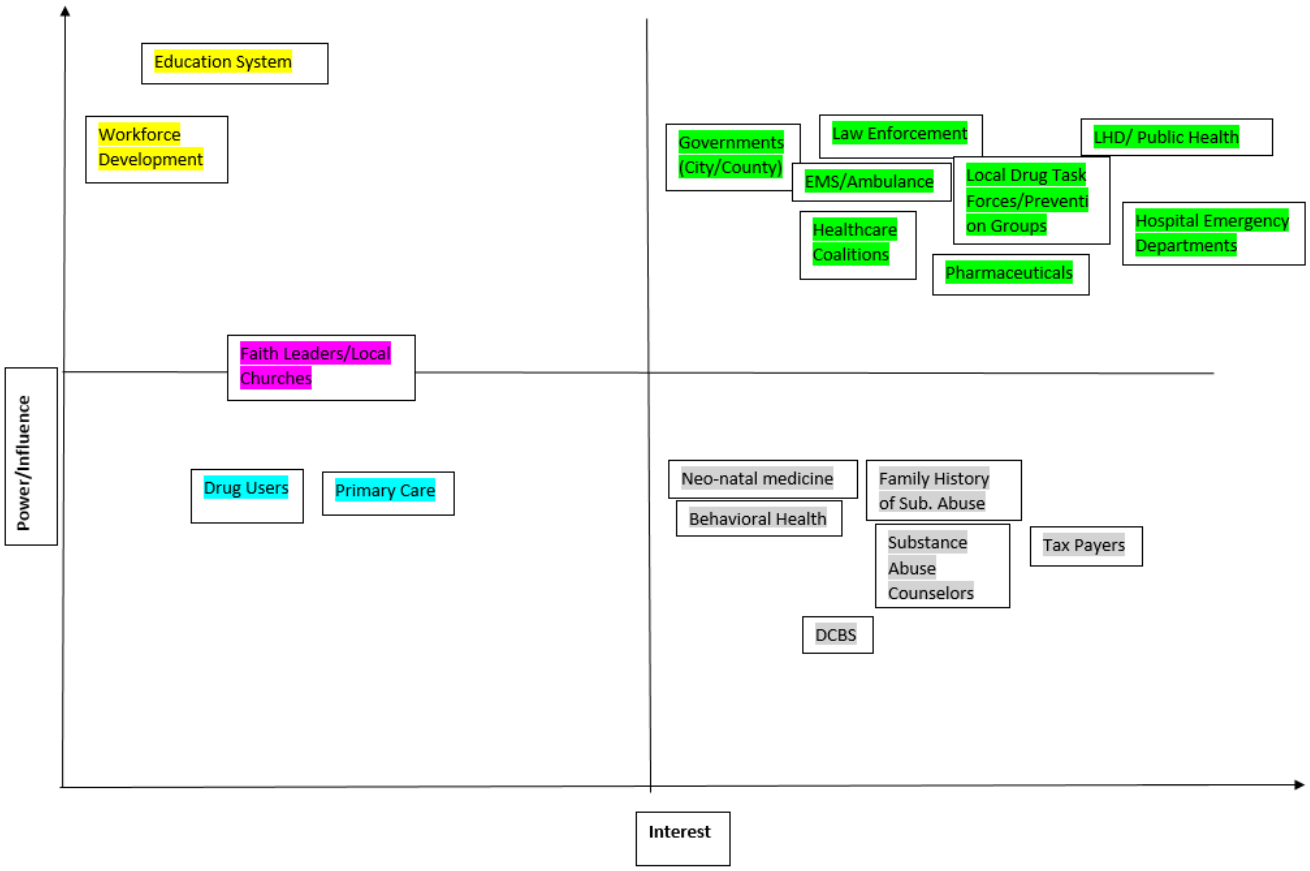


1) Understanding of the problem
2) Openness to treatment
3) Resources to help those with problems
4) Availability of drugs
5) Creation/evolution of new substances of abuse

Big Picture Document:



Stakeholder Analysis:



10 Essential Public Health Services/National Goals Supported:

Figure 1. The 10 Essential Public Health Services.

The Ten Essential Public Health Services describe public health activities that all communities should undertake[5]. This project addressed three of these areas: monitoring health (Essential Service 1); informing, educating and empowering the public (Essential Service 3); and developing policies (Essential Service 5). The project sought to monitor health status in the state in regards to drug overdose rates and associated contributing factors to inform, educate, and empower local stakeholders and policymakers to address these issues to bring about change in their communities through the development of evidence-based practices and policies.

PROJECT OBJECTIVES/DESCRIPTION/DELIVERABLES:

Project Objectives:

1. Identify possible factors that may contribute to drug abuse in Kentucky.

2. Determine which modifiable factors should be targeted through public health programming.

3. Provide communities with a toolkit of evidence-based practices to address the factors identified through the second objective.

Goals:

1. Identify and compare the different variables that contribute to overdose death rates in Kentucky.

2. Gather all data and analyze this data.

3. Research and recommend various evidence-based programs that have been implement in communities regarding substance abuse and drug overdose rates.

METHODOLOGY:

Following the meeting with the staff at KIPRC, the team collected data for the outcome variable, drug overdose death rates. KIPRC has collected this information for each of Kentucky's counties and the data is easily accessible on their website. The team was concerned about the effect that some community factors would have on the overdose death rate, including availability of Narcan and accessibility of emergency medical care. However, upon further research it became apparent that access to Narcan was similar across the state through Emergency Medical Services (EMS). The team did not control for access to emergency medical care and proximity of a medical facility to deal with a drug overdose. Originally, the team had hoped to find data on drug abuse rates and to use this as the outcome variable, but found that this data would be difficult, if not impossible to obtain and its accuracy would be questionable. The most recent year for which overdose death rates were available was 2014 and the data was reported per 100,000 residents. By reporting rates instead of counts, it was possible to compare counties of differing populations. These deaths counted by KIPRC include overdose deaths from any illicit and/or prescription drugs that were inflicted intentionally or unintentionally.

The variables included as potential risk factors were based on previous knowledge of the problem. Potential risk factors are provided below in Table 1, along with the relevant data source.

Variable Name	Variable Description	Source
ChildNeglect_2013	Number of Child Abuse/Neglect Investigations in 2013 by Type	Kids Count Data Center, Kentucky Youth Advocates
PhysicalAbuse_2013	Number of Child Abuse/Neglect Investigations in 2013 by Type	Kids Count Data Center, Kentucky Youth Advocates
SexualAbuse_2013	Number of Child Abuse/Neglect Investigations in 2013 by Type	Kids Count Data Center, Kentucky Youth Advocates
GradRate_2016	Percentage of ninth-grade cohort that graduates in four years (2012-2013 data)	County Health Rankings, The Robert Wood Johnson Foundation
Unemploy_2016	Percentage of population ages 16 and older unemployed but seeking work (2014 data)	County Health Rankings, The Robert Wood Johnson Foundation

SingleParent_2016	Percentage of children that live in a household headed by single parent (2010-2014)	County Health Rankings, The Robert Wood Johnson Foundation
MedHHInc_2016	Median household income (2014 data)	County Health Rankings, The Robert Wood Johnson Foundation
SEP_2016	Presence of a syringe exchange program within the county	Kentucky Department for Public Health
InPatTreat_2016	Presence of an inpatient treatment facility for drug abuse	
DrugDisposal_2017	Counties with a drug disposal location/program (January 2017)	Kentucky Office of Drug Control Policy
NAWS_2017	Narcotics Anonymous meeting within 20 miles of county's largest city	Narcotics Anonymous
Wet_2016	County that serves alcoholic beverages	Kentucky Department of Alcoholic Beverage Control
Poverty_2016	Percent of population living in poverty	County Health Rankings, The Robert Wood Johnson Foundation
ControlSub_2016	Actual number of all controlled substances doses per 1,000 residents for quarter 3, 2016	KASPER Quarterly Trend Report

Table 1. Risk factors for drug overdose deaths in Kentucky examined in this report, including variable name, variable description and data source.

The chosen variables listed in table 1 were selected based on the available of county level data and their potential relationship to drug abuse and overdose deaths. Variables that were not included, due to data availability or lack of completeness include: Narcan usage by local police and fire departments, implementation of D.A.R.E. drug education program for children.

Kentucky has 120 counties ranging in population size from around 3,000 people to well over 740,000 people. In order to minimize potential effects of confounding due to population size, the counties were matched based on this variable. The counties of interest were selected based on drug overdose death rates, selecting the ten counties with the highest rates and ten counties with the lowest rates. Each county was then matched with a county in similar population size, bringing the sample size, the total number of counties for analysis, to 40. Aside from minimizing confounding, this process also helped increase the power of the study by increasing the sample size. The original 20 counties of interest, along with their matched counties, are included in Table 2 and Table 3[6].

Count of Interest (Population 2014)	Matched County (Population 2014)
Leslie County (10,918)	Carroll County (10,815)
Clinton County (10,165)	Owen County (10,645)
Bell County (27,778)	Montgomery County (27,474)
Floyd County (38,108)	Calloway County (38,282)
Powell County (12,434)	Todd County (12,520)
Knott County (15,892)	Casey County (15,891)

Estill County (14,447)	Pendleton County (14,493)
Perry County (27,597)	Carter County (27,223)
Russell County (17,774)	Simpson County (17,826)
Whitley County (35,503)	Clark County (35,758)

Table 2. Ten counties with the highest overdose death rates and their population-based match.

Count of Interest (Population 2014)	**Matched County (Population 2014)**
Christian County (74,250)	Bullitt County (77,955)
Oldham County (63,490)	Pulaski County (63,825)
Nelson County (44,812)	Shelby County (44,875)
Hardin County (108,266)	Campbell County (91,833)
Henderson County (46,467)	Hopkins County (46,376)
Barren County (43,148)	Boyd County (48,832)
Graves County (37,618)	Greenup County (36,308)
Daviess County (98,275)	Madison County (87,340)
Warren County (120,460)	Boone County (126,413)
Jessamine County (50,815)	Scott County (51,284)

Table 3. Ten counties with the lowest overdose death rates and their population-based match.

Once all of the variables were selected and the necessary data collected and compiled, a linear regression model was chosen as the most appropriate statistical test to use since the outcome variable (drug overdose rates) was continuous. This test would allow determination of which variables (while controlling for others) contribute significantly to overdose deaths. The model was run using Epi Info 7.0, a free software available from the CDC.

For the first model run, all risk factors were included as independent variables. A backward-fit methodology was used for future runs, where non-significant variables were removed one by one until the explanatory power (based on the R^2 value) began to fall below the starting value of the base model that included all variables. The first model run is included below in Table 4.

Variable	Coefficient	95% Conf.	Limits	Std. Error	F-test	p-Value
ChildNeglect_2013	-0.014	-0.050	0.021	0.017	0.7084	0.407951
ControlSub_2013	0.001	0.000	0.001	0.000	6.116	0.016466**
DrugDisposal_2017	-21.057	-37.225	-4.889	7.850	7.1947	0.012770**
GradRate_2016	0.427	-0.665	1.520	0.530	0.6497	0.427817
InPatTreat_2016	5.160	-3.995	14.315	4.445	1.3476	0.256664
MedHHInc_2016	0.000	-0.001	0.001	0.000	0.0010	0.974636
NAWS_2016	4.517	-8.900	17.935	6.515	0.4808	0.494433
PhysicalAbuse_2013	-0.031	-0.133	0.072	0.050	0.3788	0.543790
Poverty_2016	1.231	0.169	2.292	0.516	5.6956	0.024894**

SEP_2016	0.693	-12.423	13.809	6.369	0.0118	0.914240
SexualAbuse_2013	0.134	-0.456	0.725	0.287	0.2187	0.644096
SingleParent_2016	0.328	-0.440	1.096	0.373	0.7724	0.387850
Unemploy_2016	0.441	0.129	0.752	0.151	8.4970	0.007400**
Wet_2016	15.035	3.681	26.389	5.513	7.4377	0.011508**
CONSTANT	-56.188	-160.032	47.656	50.421	1.2418	0.275717

Correlation Coefficient: $R^2 = 0.77$

Source	df	Sum of Squares	Mean Square	F-Statistic	p-Value
Regression	14	11319.4083	808.5292	5.9125	0.0001**
Residuals	25	3418.7004	136.7480		
Total	39	14738.1087			

Table 4. Preliminary model run with all variables included.
** significant

RESULTS:

To determine the usefulness of this model, the p-value of the ANOVA table was analyzed. Given the p-value was less than 0.05 ($p = 0.0001$) the model was statistically significant and analysis could continue. The R^2 value of 0.77 indicates that 77% of the variation seen in the data can be explained by the model. Using a backward-fit approach, non-significant variables were removed on-by-one from the model until the R^2 fell to below 0.77. The results provided below in Table 5 are the last model run with a R^2 value of 0.77 or higher. Therefore, the significant variables from this model run were included in the final model (significant variables are marked with double asterisks).

Variable	Coefficient	95% Conf.	Limits	Std Error	F-test	p-Value
ChildNeglect_2013	-0.014	-0.046	0.018	0.016	0.7782	0.385480
ControlSub_2016	0.001	0.000	0.001	0.000	7.3315	0.011609**
DrugDisposal_2017	-21.034	-35.589	-6.479	7.094	8.7925	0.006256**
GradRate_2016	0.418	-0.613	1.450	0.503	0.6925	0.412623
InPatTreat_2016	5.114	-3.623	13.851	4.258	1.4423	0.240195
NAWS_2017	4.672	-7.786	17.130	6.072	0.5920	0.448333
PhysicalAbuse_2013	-0.031	-0.129	0.067	0.048	0.4133	0.525710
Poverty_2016	1.241	0.447	2.034	0.387	10.2934	0.003427**
SexualAbuse_2013	0.126	-0.422	0.674	0.267	0.2213	0.641852
SingleParent_2016	0.335	-0.373	1.042	0.345	0.9413	0.340554
Unemploy_2016	0.438	0.144	0.733	0.143	9.3381	0.005008**
Wet_2016	15.002	4.467	25.537	5.134	8.5374	0.006952**
CONSTANT	-55.916	-154.257	42.424	47.928	1.3611	0.253547

Correlation Coefficient: R2 = 0.77

Source	df	Sum of Squares	Mean Square	F-statistic	p-Value
Regression	12	11317.5225	943.1269	7.4445	0.0000

Residuals	27	3420.5861	126.6884
Total	39	14738.1087	

Table 5. Second model run using backward fit linear regression
** significant

The final model run includes only variables that were statistically significant in model run 2. The following five variables were statistically significant and therefore included in the final model (Table 6): ControlSub_2016 (p = 0.012), DrugDisposal_2017 (p = 0.006), Poverty_2016 (p = 0.003), Unemployment_2016 (p = 0.005) and Wet_2016 (p = 0.007).

Variable	Coefficient	95% Conf.	Limits	Std Error	F-test	p-Value
ControlSub_2016	0.001	0.000	0.001	0.000	8.6297	0.005901
DrugDisposal_2017	-18.466	-30.604	-6.327	5.973	9.5573	0.003960
Poverty_2016	1.028	0.288	1.769	0.364	7.9662	0.007907
Unemploy_2016	0.501	0.232	0.769	0.132	14.3629	0.000589
Wet_2016	8.756	0.941	16.572	3.846	5.1839	0.029210
CONSTANT	-2.928	-19.493	13.638	8.152	0.1290	0.721715

Correlation Coefficient: R2 = 0.72

Source	df	Sum of Squares	Mean Square	F-statistic	p-Value
Regression	5	10557.7837	2111.5567	17.1740	0.0000
Residuals	34	4180.3249	122.9507		
Total	39	14738.1087			

Table 6. Final model run using backward fit linear regression and significant variables.

In the final model, the five variables are still statistically significant ($p < .05$) and the p-value from the ANOVA table still demonstrates that the model was statistically significant. The R^2 value of 0.72 means that 72% of the variation in the data can be explained by these five significant variables.

The final equation for the linear regression model is:

$$\begin{aligned} &Drug\ Overdose\ Death\ Rate \\ &\quad = -2.928 + (0.001 \times Controlled\ Substance\ Prescribing\ Rate) \\ &\quad - (18.466 \times Presence\ of\ Drug\ Disposal\ Site) \\ &\quad + (1.028 \times Poverty\ Rate) + (0.501 \times Unemployment\ Rate) \\ &\quad + (8.756 \times Presence\ of\ Legalized\ Alcohol\ Sales) \end{aligned}$$

As a result of this analysis, the five significant variables were studied further. Evidence-based practices for each variable were collected to guide community stakeholders and policy makers in the design and implementation of effective programs to reduce the drug overdose death rate in their community. Evidence-based practices for

preventing overdose deaths and the misuse of prescription painkillers were also reviewed and summarized following the significant variables.

Alcoholic Beverage Sales

Addressing the sale of alcoholic beverages in communities can be difficult due to possible negative economic impacts. The sale of these beverages bring revenue to communities and draw businesses and employment opportunities into the area. In areas where prohibiting the sale of alcoholic beverages is not an option, alternative programs and policies may be implemented.

Enhanced enforcement of laws prohibiting sales of alcoholic beverages to minors may be implemented. This program includes retailer compliance checks ("sting operations" involving an underage decoy) and legal or administrative sanctions against those found in violation as a means to reduce alcohol substance abuse. A systematic review evaluated eight studies and found that during enhanced enforcement programs, the proportion of decoys' successful buy attempts decreased by a median of 42%[7]. All eight studies found that enhanced enforcement was associated with a decrease in sales to decoys. The largest potential barrier to implementation of the intervention was perceived lack of community support. This evidence-based practice, verified by The Community Preventive Services Task Force is often used as part of a multicomponent, community-based effort to reduce underage drinking [8]. Findings are applicable to most communities in the U.S., including those with: on-premises (e.g., bars) and off-premises (e.g., liquor stores) establishments; rural or urban environments; different ethnic and socioeconomic groups; and various baseline rates of retail sales of alcohol to minors. It is the team's belief that this approach will face less push back from the local community than other programs designed to address the sale of alcoholic beverages.

There are additional evidence-based programs that address alcohol sales, but these approaches may be unpopular or may have political or economic consequences. These include: dram shop liability laws which allow the owner or server of a retail alcohol establishment where a customer recently consumed alcoholic beverages to be held legally responsible for the harms inflicted by the customer[9]; increasing alcoholic beverage taxes to reduce excessive consumption and related harms[10]; limiting alcohol outlet density through the use of regulatory authority (licensing and zoning) based on a positive association between outlet density and excessive consumption and related harms[11]; and maintaining limits on days and hours of sale of alcoholic beverages[12]. It is recommended that communities proceed with caution if one of these practices in implemented. Taking local political and economic climate into consideration when implementing one of these programs is also recommended.

Drug Disposal Programs

The Safe Drug Disposal is a useful guide for communities to use to dispose of prescription drugs[13]. The guide is used to introduce safe drug disposal programs for public officials and community organizers. According to the guide, nearly half of

Americans use at least one prescription drug and 10% use five or more prescription drugs. This guide is targeted towards law enforcement, pharmacies, and community members. The guide also discusses the reason why proper disposal of prescription drugs is important. Using different medicines accidentally can be very harmful and abusing prescription drugs intentionally is as well. Implementing a safe drug disposal program or a take-back program has three elements: collection, destruction, and promotion. Collection is how the prescription drugs are delivered from the consumer to the authorized collector. Destruction is the way the drugs are moved and destroyed. The last element is promotion which is the education to community members on drug disposal and the importance of it. The guide also gives two different methods to collect prescription drugs: stationary drop boxes (placed at pharmacies or police departments) and take-back events (at a location held in the community to collect the prescription drugs on a pre-planned day). The guide also describes ways that community officials and organizers can build support for these programs in their community. One of the big pieces of this is collaboration among different organizations, businesses, and groups of people which then could be made into smaller committees. The last piece of the guide addresses the ways to promote the program through online and social media outlets, service announcements, government communications, news stories, community presentations, and on-site messages.

Unemployment

Transitional jobs and vocational training for adults both have the beneficial outcome of increased employment and increased earnings[14, 15]. Businesses, government, and nonprofit leaders are all in the position to make decisions on these programs and increase employment and wages in their communities. Transitional jobs refer to subsidized positions available specifically for individuals with limited job history or those difficult to employ for other reasons. They are short-term, paid position with the purpose of temporarily helping someone make ends meet until they can obtain a standard, unsubsidized job. Vocational training refers to that for specific jobs and can be acquired on the job or through external education. It allows people to gain the skills necessary to do a particular job, thus increases their qualifications for employment in that field. An example of a vocational training program is Job Corps, which also incorporates comprehensive support services as well as financial compensation. Support services paired with financial compensation increases the likelihood of future employment and self-sufficiency.

The White House Council for Community Solutions has developed a comprehensive employer toolkit that helps establish mentorships and design work-ready training[16]. This toolkit details three lanes of engagement that employers can explore to support job skill development and workforce engagement of youth to better prepare them to enter the workforce. The three engagement methods are soft skills development, work ready skills development, and learn and earn programs. For soft skills development, an employer would provide course work and direct experience to develop generalized

workplace soft skills that could be utilized in various workplace settings. Work ready skills development involves job shadow days and career exploration guidance from an employer to better prepare youth for employment in that specific field. Learn and earn programs involve compensation for those learning a job and include examples such as paid internships and permanent positions with on-the-job training. The toolkit provides step by step implementation guidance for employers to follow in order to establish a more work ready population.

Poverty

Evidence-based policies to combat poverty range in feasibility. Some, such as the earned income tax credit, rely entirely on government level action. Others, such as child care subsidies and career academies, can be implemented by employers, schools, and nonprofit organizations.

The earned income tax credit is a refundable income tax credit for low to moderate income working families[17]. This allows them to keep more of their paycheck when filing taxes by decreasing their taxable income, and also helps increase employment. Community leaders should consider educating members of their communities on this tax credit, since it may not be a benefit in the forefront when it comes to accepting a low or moderate income job.

Child-care subsidies are a straightforward tool that can be provided by government, non-profits, employers or philanthropic organizations[18]. With child-care subsidies, working parents or parents attending school would receive a subsidy to help cover their childcare costs. This has multiple potential benefits. First, it makes childcare more affordable. Affordable childcare leads to an increase in earnings and also encourages parents to continue working or going to school. Overall, this leads to a more productive society with workers who are able to manage the balance between work and home life because more of their paycheck is available to cover housing, food, or other essential necessities.

Career academies have some evidence that they may help decrease poverty[19]. This concept can also help to address unemployment. In one study, a career academy was set up in a low-income area school. The career academy allowed for students to gain vocational skills that would easily translate to jobs after graduation, and also included curriculum on the basics of career building. Career academies can offer workplace partnerships with employers that benefit both parties, since the students will be prepared for a job with that workplace prior to employment. Over 8 years following graduation, this study showed an 11% increase in earnings by the academy participants compared to non-academy students. This is a promising practice that many communities could easily implement by increasing partnerships between schools and employers.

Controlled Substance Prescribing

The American Public Health Association (APHA) issued a policy statement in November of 2015 regarding prevention and intervention strategies to decrease misuse of prescription painkillers[20]. Three recommendations address legislation. The first is legislation that would require practitioners (widely defined to include those prescribing as well as those dispensing or distributing controlled substances) to evaluate a patient's physical and mental status before prescribing or dispensing those drugs. Another legislative recommendation is to put in place specific laws to prevent patients from "doctor shopping" in order to receive controlled substances from multiple providers. The last legislative recommendation is to add increased regulation to pain management clinics that dispense a large amount of prescriptions for controlled substances. Examples are requiring those clinic to obtain a license or certificate to be registered with the state, requiring prescribers to be in good standing, and conducting unannounced inspections to verify compliance.

Additional APHA recommendations focus on education for providers and prescribers[20]. Appropriate diagnosis and treatment of chronic pain, as well as alternative methods for treatment are areas that need increased education. Alternative methods for treatment include physical therapy, acupuncture, and non-narcotic therapy and may be appropriate options to avoid the use of opioids. These recommendations put more responsibility on providers to look out for the overall well-being of their patient and treat the whole person instead of just one symptom or aspect of their health.

Preventing Drug Overdose Deaths

There are a number of evidence-based practices with the end goal of preventing drug overdose deaths. One such practice is the presence of a prescription monitoring program (PMP)[21]. These programs require prescribers to review a patient's drug history prior to initiating a new opioid prescription. Kentucky has a PMP called the Kentucky All Schedule Prescription Electronic Reporting (KASPER). To improve the quality of patient care and decrease the likelihood of patients abusing their prescriptions, prescribers should be required to check these programs not only prior to initiating a prescription, but at a set frequency over the duration of their prescription.[21]

There is also evidence that medication-assisted treatment improves outcomes such as frequency of opioid use and mortality.[21] Barriers to this type of treatment still exist and include things such as cost or availability of local providers, regulatory factors, and the stigma and aversion to placing substance abuse treatment clinic in communities. The American Public Health Association (APHA) recommends counseling paired with medication-assisted treatment for great efficacy, as well as increased training for substance abuse treatment specialists and increased availability of treatment facilities[20].

A less established but still promising approach to preventing drug overdose deaths is a modification of one commonly used for reducing harmful alcohol use. As it relates to opioids, this method would include Screening, Treatment Initiation, and Referral to

Treatment (STIR)[21]. The STIR method has shown promise in the Emergency Department setting at hospitals. The initial healthcare visit, in this case an emergency visit, incorporates initiation into treatment and treats opioid addiction like other chronic conditions. The ED physician would assess the patient's condition and in the presence of opioid abuse and would initiate and refer to treatment, just as they would for someone with diabetes or hypertension.

Naloxone (Narcan) use for those addicted to opioids is an APHA recommendation that an increasing number of Kentucky communities are embracing[20]. First responders, family, and friends of those addicted to opioids can prevent death if they are educated on the signs and symptoms of an overdose and taught how to appropriately administer naloxone.

CONCLUSIONS:

This project assessed risk and protective factors related to drug overdose deaths. Five variables were determined to be significant through statistical analysis. These were further researched and evidence based practices for each were presented. This shows that communities have the ability to promote community resilience to the negative impact of drug abuse through policies and practices. While this is truly a nationwide problem gripping communities everywhere, resilience and change must start at the local level. The interventions presented show that communities can make a difference in the outcomes of a foundational part of their community: the people.

Drug use and abuse is a multifaceted issue. While this project aimed at assessing modifiable contributing factors, there is still a great deal of work that can be done to continue addressing the problem. Hopefully future groups will build upon this foundation and further assist in creating a culture of health in Kentucky.

LEADERSHIP DEVELOPMENT OPPORTUNITIES:

Brittany Bell

While I am at the conclusion of the KPHLI program, I feel like my work has just begun. This program has helped me identify both strengths and weaknesses, some of which were a surprise to me. Going forward, I plan to focus on developing my social skills. My Emergenetics profile demonstrated I was overwhelmingly an analytical and structural thinker, meaning conceptual and social thinking is a much smaller portion of my personality. I would like to work on improving these aspects of my personality in the future. One thing in particular that stuck out to me was the concept of passive neglect, something I am quite guilty of in both my personal and professional life. One goal of mine is to work on improving this. During the KPHLI process I have also enjoyed working closely with my colleagues across the state and I look forward to continuing our partnership.

Amber Broaddus

I am so fortunate to have had the opportunity to participate in KPHLI and develop my leadership skills. Through this process, I have discovered several of my strengths and weaknesses. I have also learned how to apply other individual's strengths to complement my weaknesses. More than anything KPHLI has given me the confidence in my role as a leader in public health.

As a newcomer to working for a local health department agency it can be a challenging at times trying to learn a new role while also working with many different individuals with different personalities and thought processes. Learning about myself and how to work with other individual's strengths while also working on my weaknesses is very valuable to not only success in my career but also to the success of my agency.

Jeanette Hart

I am a lifelong learner and appreciate the insight I have gained through the KPHLI process. The gift of self-reflection has allowed me to embrace my strengths and natural gifts, set goals and develop action plans while actively trying to lift others around me. Working in small group settings allowed us to have open conversations about our personalities and how we are wired which made for interesting talks. A big thank you to my team for being a dynamic group of people who I otherwise would not have met if it hadn't been for this program.

Molly Roberts

One of the biggest take-home messages from participating in KPHLI is the need for understanding ourselves – how our brains work, how we think about things, how we prefer to learn and lead – paired with an understanding of those same qualities in others. In Public Health, we are all a part of the same team, but if we don't lead with understanding, we won't get anywhere. Combining the knowledge of ourselves and our colleagues is what leads to successful collaboration and better teamwork. It has been extremely eye-opening to see the ways in which I can be the best team player and translate that into my work with others. The Change Master Project was a strong example of how everyone can and will bring something different to the t able, and that's what makes us better.

Being a KPHLI scholar forces you to reflect on your own strengths and weaknesses, as well as think analytically in a new and different way. These skills will not disappear after graduation. I am grateful to have had the opportunity to go through this process and I know that it has already helped me become a better public health leader.

Riley Willett

Throughout this year in KPHLI, I have grown much more as an individual and leader. I have also realized the strengths I possess and the weaknesses that I need to work on. My overall experience throughout this year has been very rewarding. I have

developed several relationships with people across the state and have learned much from them as well. I am very thankful I have had the opportunity to be involved in KPHLI and look forward to the future in my growth as a public health leader.

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