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Effects of the needle exchange program implemented in West Virginia

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**EFFECTS OF THE NEEDLE EXCHANGE PROGRAM IMPLEMENTED IN WEST
VIRGINIA**

ABSTRACT

Introduction: West Virginia has had a recent spike in infectious diseases such as HIV and hepatitis due to increased rates of injectable drug use. The rising costs associated with such diseases have been a cause for concern in the sector of healthcare and public health. In the state, the exchanging of dirty needles has resulted in the spread of bloodborne pathogens, however, the implementation of needle exchange programs has sought to decrease the rates of infection, improve health outcomes, and lower healthcare costs. However, there is a question as to the effectiveness of such programs.

Purpose of Study: The purpose of this study was to examine the effects of the needle exchange program in West Virginia to determine its influence on healthcare costs, rates of infectious disease, and prevalence of drug users.

Methodology: For this study, a literature review was utilized with a total of 60 relevant citations having been collected from seven databases and various websites. After review, 43 sources were deemed relevant to the study with a total of 17 used in the results section. Semi-structured interviews were also conducted virtually with the interviews in question having been approved by an institutional review board, conducted virtually, and informed consent being obtained verbally. The articles included in the study were limited to those in English and those published from the years 2010 to 2021.

Results: The research showed that the implementation of needle exchange programs in West Virginia led to decreased rates of HIV and hepatitis among injection drug users. Preventative measures taken by the program also helped to avert future healthcare costs related to the treatment of infectious diseases.

Discussion/Conclusion: The research demonstrated that there was a positive relationship between the implementation of needle exchange programs and healthcare outcomes, healthcare costs, and the spread of bloodborne diseases.

Key Words: Bloodborne Diseases, Health Outcomes, Healthcare Costs, Needle Exchange Program, Syringe Exchange Programs, West Virginia

INTRODUCTION

One of the foremost issues that has impacted the state of healthcare in West Virginia has been the rising costs in treatments for bloodborne infections (Bates, Annie, Jha, & Kerns, 2019). Bloodborne pathogens and their resulting diseases have commonly spread through the exchanging of dirty needles (Denault & Gardner, 2021). In West Virginia, needle exchange programs have been implemented to reduce the transmission of certain infections, such as HIV, hepatitis B, and hepatitis C, which have been found to be more common among drug users (Beck & Kersey, 2018). From 2005 to 2015, the number of people injecting drugs had risen from 36% to 54% (Merino, Bowden, Katamneni, & Coustatte, 2019). In 2011, the total United States (US) cost of opioid abuse, specifically prescription, was approximately 25 billion, while criminal justice costs were found to be nearly \$5.1 billion (Merino et al., 2019). In 2015, West Virginia had the second-highest rate of cases of hepatitis C Virus (HCV) in the country (3.4 per 100,000)

and has had many of the demographic characteristics of People Who Inject Drugs (PWID) who were found to be driving the US epidemic (Davis, Davidov, Kristjansson, Zullig, & Baus, 2018).

The rate of overdose has drastically increased over the last decade in the US (Dasgupta, Beletsky, & Ciccarone, 2018). In 2015, West Virginia had the highest rate of overdose of 33,091, accounting for 41.5 deaths per 100,000 people (Hedegaard, Warner, & Minino, 2017). Furthermore, roughly 37% of the US population was found to be living with HIV (Avert, 2018). The HIV rate increased over 300% in West Virginia, between the years of 2007 and 2015, with the most frequently indicated risk factors for acquiring HIV infections being used drugs distributed on the street and injection drug use (Rudd, Seth, David, & Scholl, 2016). In response to these high rates, needle exchange programs opened in West Virginia starting in 2015, with the first opening in one of the largest cities of Huntington (Davis, Daily, Kristjansson, Kelley, & Zullig, 2017).

With an average of roughly 41.5 deaths per 100,000 people in 2015 related to drug overdoses, West Virginia has also been labeled a center of illegal drug use (Dydyk, Sizemore, Trachsel, Conermann, & Porter, 2021). These spikes in drug overdoses have been related to an over-prescription issue that plagued the region previously (Okorie, 2019). In fact, West Virginia was found to have led the US in the opioid crisis in 2015, with the state having dominated in opioid-related overdose deaths in the country (Kaski, Brooks, Wen, Haut, Siderovski, & 2019). In the same year, West Virginia was also determined to be home to one of the country's highest synthetic opioid death rates, with roughly 26.3 persons per every 100,000 persons (Seth, Scholl, Rudd, & Bacon, 2018). Lastly, West Virginia, behind Indiana, had the second-highest hepatitis

C virus (HCV) infection rate in 2018, at 3.9 persons per 100,000 (CDC, 2018).

The issue of dirty needle utilization has been one that has plagued West Virginia for years (Vestal, 2016). The needle exchange program provided referrals to various treatment programs, education concerning proper injection practices, counseling, vaccinations, health screenings, and access to sterile equipment such as needles and syringes, among other services (Phillips, Coustasse, Johnson, & Washington, 2018). However, Charleston, West Virginia, experienced numerous complaints in concern to needle use, with requests to local government workers or law enforcement to pick up and discard needles left in public places (Ondocsin, Mars, Howe, & Ciccarone, 2020). Firefighters in Charleston, West Virginia, have reported attending fires in abandoned homes filled with empty needles from homeless drug addicts who trespass into the houses while looking for places to sleep (O'Rourke, White, Park, Rodriguez, & Kilkenny, 2019). As a result of these incidents Charleston suspended its health-department run needle exchange program in March of 2018 (Beck & Kersey, 2018). Subsequently, there have been spikes in new cases of HIV among intravenous drug users in Kanawha County (Padgett, 2021).

Healthcare costs and health outcomes related to drug use varied from patient to patient (Gryczynski, Schwartz, O'Grady, Restivo, & Mitchell, 2016). However, for patients with substance-use-related infections, hospitalization costs were often deemed catastrophic. For example, for an infected patient with HIV, lifetime costs have been found to total more than \$450,000 (Bingham, Shrestha, Khurana, Jacobson, & Farnham, 2021). Researchers have found that syringe service programs (SSPs) helped lower infection rates, lessened the presence of needles in public places, and reduced health care costs (CDC, 2019). However, the economic

impact of these types of initiatives have been the subject of intense scrutiny and as such the evaluation of their effectiveness has been deemed imperative to the survival of such programs (Des Jarlais, 2017).

The purpose of this research was to evaluate the effects of the needle exchange program to determine its impact on healthcare costs, the spread of infectious diseases, and the prevalence of drug users in West Virginia.

METHODOLOGY

The hypothesis of this study was: needle exchange programs in West Virginia have helped to improve health outcomes by minimizing rates of infection among drug users and by reducing preventable healthcare costs through the implementation of the exchanging of clean needles, health screenings, and other education services.

The methodology for this qualitative study was a literature review with semi-structured interviews from healthcare providers with experience working with the program and from individuals who have seen the effects of the needle exchange program firsthand. The interviews in question were approved by an institutional review board. The semi-structured interviews were conducted virtually and recorded; informed consent was verbally obtained (see questions in appendix). The conceptual framework for this review was adapted from the steps and research used by Yao, Chu, and Li (2010). The framework shows the course of needle exchange program effectiveness in addressing the problems of the spread of HIV and hepatitis. An evaluation of needle exchange programs in WV communities was conducted to determine their efficacy in reducing HIV and hepatitis. When issues arise within a community that calls for review of its

need for continued support, a cyclic path begins. An evaluation of the benefits and barriers to needle exchange programs was deemed necessary in order to promote continuation. After implementation, the need for the needle exchange programs was reassessed, and the cycle began again (Figure 1). As the purpose of this review is in the effectiveness of the needle exchange programs in communities, the framework is appropriate for this study. Research articles, journals and peer-reviewed literature were located using Google Scholar, EbscoHost, NCBI, Marshall University's Summon, ScienceDirect, JSTOR, and PubMed research databases. The Google search engine was also used to review research from certain government-based websites such as the Centers for Disease Control. Keywords that were utilized to find these references were 'West Virginia' AND 'Needle Exchange Program' OR 'Syringe Exchange Programs' AND 'Healthcare Costs' OR 'Bloodborne Diseases' OR 'Health Outcomes'. This search was completed by AG, KD, and AU and validated by KD who acted as a second reviewer and determined if the references met the inclusion criteria as outlined by the group members.

The criteria for inclusion of information on the impact of the needle exchange program on healthcare costs and health outcomes in West Virginia was any scholarly article, website, or government report or publication, written in English, and published between 2010 and 2021. A total of 75 sources were reviewed utilizing PRISMA (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009), but the only articles that were included (N=43) were those that met the inclusion criteria. Articles were excluded if they did not match the inclusion criteria (N=32). Of the 43 references utilized all were subject to full-text review, and each were included in the data abstraction and analysis. The applicable publications were kept at 43 after review, 17 of which were included in the results (See Figure 2).

RESULTS

West Virginia's Opioid Epidemic

Next Harm Reduction organization, a non-profit online website that provides supplies, education, and support to drug abuse users, found that research has proven that harm reduction programs and needle exchanges did not increase or promote substance or drug abuse but rather facilitated people to get the proper care they needed (PBS, 2021). A spokesman for the organization explained that removing needle exchange programs not only facilitated HIV and hepatitis C transmission but forced drug users to engage in extremely dangerous behavior, such as sharing needles with one another or utilizing the same needle up to 20 to 30 times (PBS, 2021). It was also stated that needle exchange programs do more than hand out needles and syringes to people, they also allowed them access to case management, linkage to care, advocacy, and referrals into drug treatment (PBS, 2021). Needle exchange programs have been found to reduce HIV transmission rates by one third to two-fifths (ACLU, 2021). They do this by focusing on essential components to harm reduction and harm minimization policies (Allen, Grieb, O'Rourke, Yoder, & Planchet, 2019). Many have provided access to sterile paraphernalia, acting as access points to discard used needles and even providing condoms and additional services to reduce the spread of disease amongst the community (Fernandes, Cary, Duarte, Jesus, & Alarcao, 2017).

Participants of needle exchange programs were found to have been five times more likely to enter drug treatment when compared to those who had never participated in the program

(ACLU, 2021). In 2017, Cabell County, WV recorded a total of 831 nonfatal overdose and 182 overdose deaths (Fire Chief for the City of Huntington Fire Department Interview, 2021). In 2018, however, with the continued implementation of needle exchange programs in the county, the number of nonfatal overdoses had decreased 40% and decreased another 25% for fatal overdoses (Fire Chief for the City of Huntington Fire Department Interview, 2021). In total, the clean needle exchange program was found to have prevented an estimated 200 overdoses in Cabell County since 2015, the year of implementation of the program (Physician Expert Cabell County Health Department, 2021). According to one expert, the estimated cost of one overdose death was valued at \$1.1 million and healthcare costs associated with IV drug use were valued at \$1 million dollars (Physician Expert Cabell County Health Department, 2021). Translated, the money saved in preventing one overdose could run the clean needle exchange program for two years (Physician Expert Cabell County Health Department, 2021).

One study found that the preventative HIV costs associated with needle-exchange programs totaled between \$4,000 and \$12,000 annually per injecting drug user (Iozzio, 2011). For an average to smaller city in the US, the cost of running a needle exchange program was deemed somewhere near \$160,000 or about \$20 per user per year (ACLU, 2021). For reference, treating an individual for HIV, specifically an injecting drug user, costs upwards of \$190,000 every year (Iozzio, 2011). Therefore, the costs associated with running a needle exchange program amounted to less than the treatment costs for one infected HIV patient in some cities.

A single tri-state needle exchange program that services Kentucky, Ohio, and West Virginia, reported that it collected more than 27,000 needles (Bixler, Corby-Lee, Proescholdbell,

Ramirez, & Kilkenny, 2018). A spokesman for the program explained that those are 27,000 needles that would have been left in the streets and exposed citizens to public harm if it was not for the operation of needle exchange programs (Suro, 2017). Other actions that included going beyond handing out clean needles or educating and providing resources to needle and syringe users included needle exchange programs successfully catching HIV outbreaks. Through its screening and questioning of needle users, a needle exchange group in Charleston, West Virginia, named Solutions Oriented Addiction Response or SOAR, discovered an HIV outbreak, specifically in Cabell County, that spread to roughly 50 individuals (Vergano, 2021). The severity of the need for needle exchange programs has been showcased in the fact that two of the four most significant HIV outbreaks to occur in the US in 2021 occurred in West Virginia and that these needle exchange programs helped to eliminate the rapid transmission of HIV primarily from those who injected heroin, fentanyl, and methamphetamines because of opioid addiction (Vergano, 2021). It has also been reported that the use of dirty needles in West Virginia was a public health disaster as Charleston, with nearly 178,000 citizens, had been found to have a higher rate of new HIV cases with 35 new cases in 2020 compared to New York City who had a recorded 36 HIV cases tied to intravenous drug use in 2019, but with a population of more than 8 million (Raby, 2021). An examination into the importance of needle exchange programs found that with an annual \$10 to \$50 million funding increase 194-816 HIV infections would be averted (Nguyen, Weir, Des Jarlais, Pinkerton, & Holtgrave, 2014). The cost per infection averted was totaled somewhere between \$51,601 and \$61,302 meaning that the rate of financial return would be between 7.58 and 6.38 (Nguyen et al., 2014).

Needle exchange programs have intended to target even the worst of the needle sharers. “Distributive syringe sharers” have been described as self-identified users at needle exchange sites who report having shared their syringes multiple times in a previous 30-day period (Adams, An, Broz, Burnett, & Wejnert, 2019). In March of 2018, with Kanawha County in the middle of an overdose epidemic that followed with an HIV outbreak, the needle exchange program in Charleston, WV suspended health department operations (Pollini, 2019). The state capital was left with little to no sterile needles for drug users, leaving needle users desperate, digging in the dirt or trash for old needles (Leffler, 2021). This allowed for a spike in the spread of infectious bloodborne diseases within the region and it also resulted in the ending of one of the most studied methods to prevent the spread of HIV and hepatitis C (Peace, 2020). From 2014 to 2019, during which time the Kanawha health department needle exchange program remained disbanded, there was an uptick in HIV cases related to intravenous drug use from 12.5% to 62.4% (Raby, 2021). Thus, an association between the closing of the needle exchange program was recognized as a reason for the increased rates of hepatitis C and HIV in the state (Davis, Kristjansson, Davidov, Zullig, & Baus, 2019).

DISCUSSION

The purpose of this research study was to evaluate the effects of needle exchange programs implemented in West Virginia. The literature review and semi-structured interviews suggested a strong relationship between the implementation of needle exchange programs and decreased incidents of bloodborne infections, increased health outcomes, and decreased health costs.

The hypothesis that the needle exchange programs in West Virginia helped to improve

health outcomes by minimizing rates of infection among drug users and by reducing preventable healthcare costs through the implementation of the exchanging of clean needles, health screenings, and other education services was therefore accepted based on the information and data analyzed. The needle exchange programs in the state were also found to have provided numerous other benefits such as the reduction of dirty needles in public spaces and the utilization of other public health services for drug users.

Opinions Provided by Semi-Structured Interview

The Executive Director of Cabell-Huntington Health Department who has served on several advisory panels for WV Bureau for Public Health and the Governor's Advisory Council on Substance Abuse, Prevention, and Treatment was interviewed. According to the physician expert, the clean needle exchange program was instrumental in reducing needle sharing and reducing hepatitis and HIV diagnosis in Cabell County, WV. Data has been reported that only 2 out of every 3 people who inject drugs have been using this program, however, this number helped to show a reduction in HIV and hepatitis which allowed for the program to be deemed successful. However, one goal of the Cabell County Health Department has been to implement greater outreach to people who inject drugs by being able to get more agencies involved in the distribution, testing, and support of the program (Physician Expert Cabell County Health Department, 2021). The Fire Chief of Huntington, West Virginia also concluded that Cabell County has benefited from the clean needle exchange program based on data recorded since 2015 (Fire Chief for the City of Huntington Fire Department Interview, 2021).

Limitations of the Study

Limitations of the study included the amount of information available on the specific topic of the effects of needle exchange programs in West Virginia. Peer-reviewed literature was minimal regarding the amount of published data and reported findings concerning needle exchange programs in the state. Often, peer-reviewed literature on needle-exchange programs covered its effects on the US as a whole, or larger more populated cities, states, and regions in the US. With the number of databases used for research limited to seven there is the possibility of implicit publication bias from the sources utilized. The particular search strategy used may have also limited the number of relevant articles that appeared. Additionally, some group members are employed in the healthcare field which introduces another potential source of bias; however, none work in connection with any needle exchange programs.

Practical Implications

There has been significant controversy regarding needle exchange programs in West Virginia as there has been an opinion that needle exchange programs enable drug users and needle users. As a result, needle exchange programs such as those in Kanawha County have been disbanded. However, this study confirmed that the implementation of needle exchange programs helped to positively impact healthcare costs and outcomes. The information therefore reinforced the importance of needle exchange programs in their efforts to improve public health by reducing the spread of disease among injection drug users.

CONCLUSION

Needle exchange programs have demonstrated their effectiveness in terms of cost benefits, health outcomes, and public health outreach. This literature review has indicated that proper

utilization of such programs not only lowers healthcare costs, but also improves healthcare outcomes related to the spread of bloodborne infections caused as a result of dirty needles. Thus, the primary hypothesis introduced has been supported by this research.

Figure 1: Conceptual Framework for the continuation of the needle exchange programs in West Virginia communities adapted from Yao, Chu, and Li (2010).

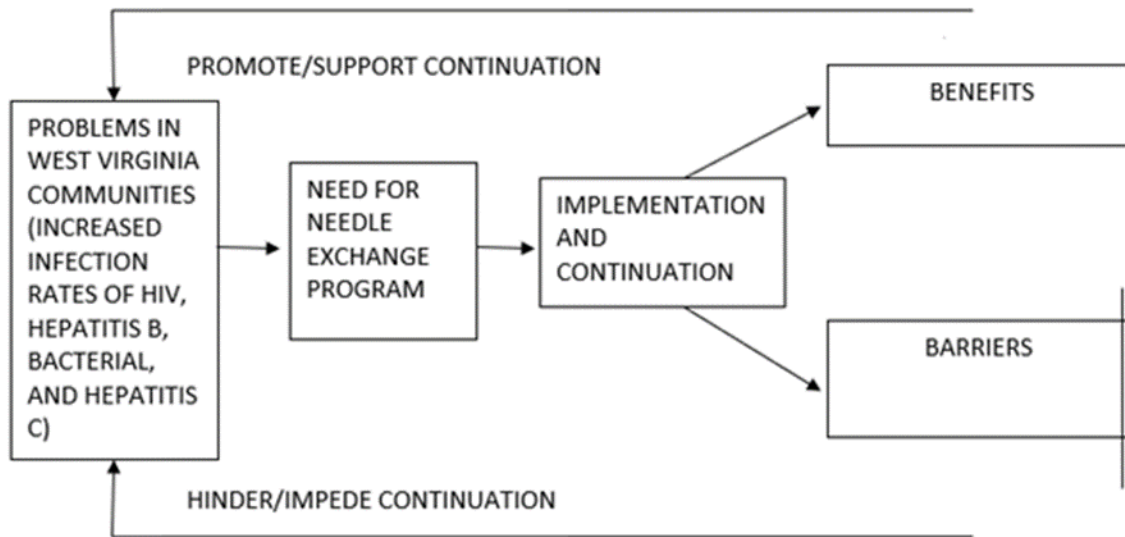
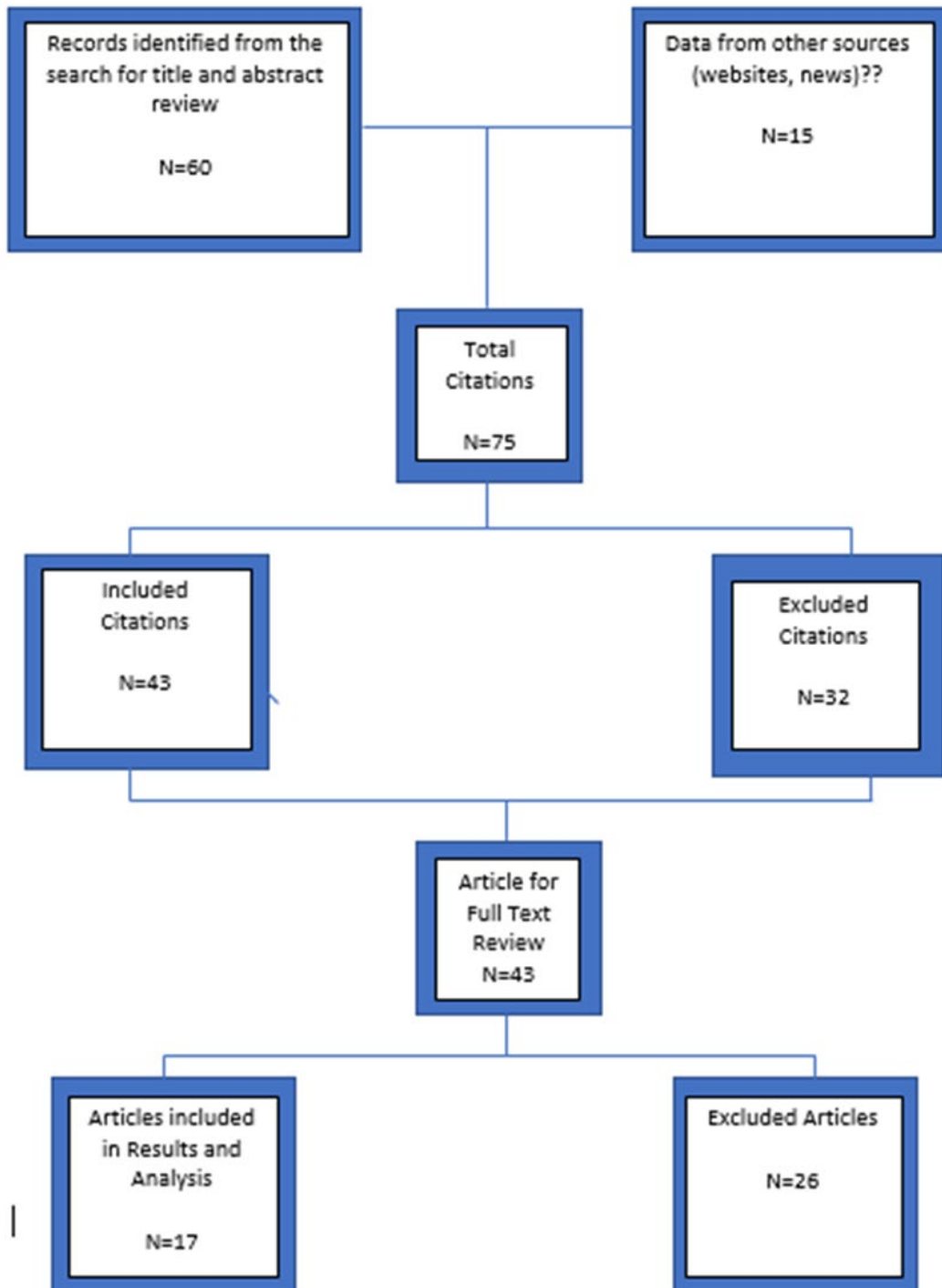


Figure 2: Overview of Literature Evaluation adapted from Moher, Liberati, Tetzlaff, Altman, The PRISMA Group (2009).



APPENDIX

Questions from Interviews

1. As an active healthcare provider, what do you think the needle exchange program provides in terms of preventative health measures? How does it do so?
2. Since the pandemic, have you seen an increase or decrease in individuals utilizing the needle exchange program, including the option to exchange dirty needles for clean ones? Why?
3. What are some other reasons people utilize the services provided by the needle exchange program and what are the goals of these other services?
4. What are the greatest benefits that the needle exchange program has offered to drug users?
5. Do you think the program seeks to address concerns related to the mental health of drug users?
6. Do you think this program plays a crucial role in drug rehabilitation efforts? If so, why, and how?
7. Do you think that the program has helped to lower the rate of infectious diseases in West Virginia (any statistics to back this up)?
8. Who are the main forces trying to disband the needle exchange program in WV?
9. Why are they doing so and what effects may such an action cause?

10. Why are there controversies surrounding the needle exchange program?

11. Where do you see the future of the program heading and in what direction do you personally want it to go?

12. Overall, do you think the positives of the program outweigh the negatives? Why?