



Social determinants of HIV/HCV co-infection: A case study from people who inject drugs in rural Puerto Rico



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1. Introduction

Worldwide there are an estimated 130 million people infected with hepatitis C (HCV), 40 million living with HIV, and between 4 and 5 million co-infected with HIV and HCV (Alter, 2006; Perz, Farrington, Pecoraro, Hutin, & Armstrong, 2004; WHO. AIDS epidemic update, 2004). In Western Europe and the United States, co-infection tends to concentrate among people who inject drugs (PWID) mainly driven by blood contained in shared syringes and contaminated injection equipment (Hahn, Page-Schafer, Lum, et al., 2002; Doerrbecker, Behrendt, Matheu-Gelabert et al., 2013). Epidemiological data shows wide discrepancies in HIV/HCV prevalence among PWID across the world (Bao & Li, 2009; Rahimi-Movaghar, Razaghi, Sahim-Izadian, & Amin-Esmaeili, 2010). In Western Europe some studies involving HIV positive individuals with a history of injection drug use documented a HIV/HCV co-infection rate of around 66%, while similar studies conducted on positive HIV patients who inject drugs enrolled in a large HIV clinical trial showed that between 72%–95% were co-infected with HCV (Denis et al., 1997; Roca et al., 2003; Sherman, Rouster, Chung, & Rajcic, 2002; Sulkowski & Thomas, 2003).

>30 years after its identification, HIV/AIDS remains one of the most serious public health problems in the United States and the world. The concern is especially high in Puerto Rico, one of the U.S. island territories. In 2010, the rate of HIV infection diagnosis in Puerto Rico was 33.8 per 100,000 population, the fourth highest in the U.S., while the infection rate for the U.S. as a whole was 19.7 (Centers for Disease Control and Prevention, 2015). Further, the island's HIV death rate is nearly 4 times higher than the national average, higher than any other U.S. state or territory (<http://www.aidsunited.org/Programs-0024-Grantmaking/Puerto-Rico.aspx>, n.d). The most common HIV

transmission method in Puerto Rico is injection drug use—42% of male HIV cases are attributed to injection drug use, exactly double that of the U.S. as a whole which attributes 21% of male HIV cases to injection drug use. HCV has a prevalence among the general population on the island of close to 2% (Perez, Marrero, Melendez, et al., 2010) but most cases tend to concentrate in PWID where studies have shown a prevalence close to 90% in urban settings and 80% in rural areas (Reyes, Colon, Robles, et al., 2006; Abadie, Welch-Lazoritz, Acosta-Gelpi, Reyes, & Dombrowski, 2016).

Frequency of drug use, years of injection, using shooting galleries, number of injection partners, along with sharing syringes and injection equipment has been associated with a higher risk of HIV transmission (Miller et al., 2002; Dolan et al., 2010; Rolls, Sacks-Davis, Jenkinson, et al., 2013). While the social determinants of HIV transmission in PWID have been extensively studied (Gilbert et al., 2013; Des Jarlais et al., 2012; Travis et al., 2014), studies should be conducted specifically addressing the social determinants of HIV and HCV co-infection among PWID in order to develop more targeted and effective prevention strategies.

The current paper seeks to explore social and behavioral determinants of HIV and HCV co-infection among PWID in rural areas of Puerto Rico. A case study based on ($n = 315$) current intravenous drug users shows that 6% of the population ($n = 19$) is co-infected with both viruses. Co-infection correlates with age, longer period of drug use, medical insurance coverage and sexual identity. A positive HIV diagnosis was found to be a strong predictor of co-infection. No differences were found in risk behaviors, both groups report similar frequencies of drug use and sharing of needles and equipment but co-infected used reported using a new syringe at a higher frequency than those who were not co-infected.

2. Methods

2.1. Data

This paper utilizes data from 315 injection drug users residing in Cidra, Comerio, Aguas Buenas, and Cayey, four rural towns in the mountainous area of central Puerto Rico, about 30–40 miles from San Juan. Sites were selected because they were representative of rural PWID on the island (López, de Saxe Zerden, Bourgois, et al., 2015). In addition, these sites were chosen due to the presence of *El Punto en la Montaña*, the only syringe exchange program operating in rural Puerto Rico,

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infection is critical in order to develop more effective prevention strategies. By outlining the factors that lead to co-infection, this paper contributes to identify the behaviors or risk profiles that need to be addressed to prevent the further spread of HCV among PWID in Puerto Rico and abroad.

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Contributions

RA conducted data collection and drafted the manuscript. MW coordinated the study and performed the data analysis. BK and KD conceived and designed the study and helped to draft the manuscript. All authors read and approved the final manuscript.

Conflict of interest

All authors declare that they have no conflicts of interest.

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