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HUMAN TRAFFICKING IN THE AMERICAS: COMPARISON OF ORIGINAL SOURCE COMPILATION VERSUS UNODC DATA

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A Thesis

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In Partial Fulfillment

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in

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by

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ABSTRACT

International human trafficking (IHT) is a type of criminal activity that involves groups and individuals who facilitate the global movement and exploitation of people, often by illegal means. Estimates show that, worldwide, there are over 25 million victims of human trafficking at any given time; however, estimates are prone to under and overcounting. Focusing on the Americas, this study compared the quality of two data sources that could be used to observe IHT. Country-to-country IHT networks generated from 9 years of researcher compiled governmental and non-governmental data (2008-2017) was compared with networks generated from data downloaded from the United Nations Offices of Drugs and Crimes (UNODC). Analyzing the data quality over time, on three characteristics (completeness, variable positional importance, and realism) this investigation showed that original source compilation produces more complete and realistic networks when compared to UNODC data.

DEDICATION

This work is a fruit of continuous and arduous sacrifice. This thesis is heartily and proudly dedicated to all the people who serve as an inspiration. A special feeling of gratitude to my loving parents, Jose Luis Avila Medina and Manual Jimenez de Avila, whose words of encouragement and push for tenacity ring in my ears.

I also dedicate this thesis to all my family, classmates, and circle of friends who extend their help in various forms during this work. I give special thanks to the faculty and staff from the School of Criminology and Criminal Justice at CSUSB for all the encouragement and help I received during this process.

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CHAPTER ONE:

INTRODUCTION

International Human Trafficking

International human trafficking (IHT) is a form of criminal activity in which groups and individuals facilitate the global movement and exploitation of people, often through illegal means. According to the United Nations Office on Drugs and Crime (UNODC), IHT involves the recruitment, transportation, transfer, harboring, or receipt of people through force, fraud, or deception, with the aim of exploiting them for profit (United Nations Office on Drugs and Crime, 2022). Human traffickers participate in a competitive market system that supplies people who provide many services. These trafficking markets operate with varying levels of sophistication and organization (Wheaton, Schauer, & Galli, 2010; Finckenauer & Schrock, 2000; Reid, 2012).

IHT is intertwined with macro-processes associated with the global movement of people, as defined by Freeman (2006). These macro-processes involve people crossing international borders through various forms such as immigration, international student flows, business travel, and tourism. While it is important to note that not all global movement of people leads to instances of IHT, it remains a significant factor that can influence the prevalence of IHT within a country.

Two primary forms of exploitation related to IHT are sex trafficking and labor trafficking. As defined by the Trafficking Victims Protection Act of 2000, sex

trafficking involves various actions such as recruitment, transportation, provision, obtaining, patronizing, or soliciting individuals for engaging in commercial sex acts (Polaris, 2022). Sex trafficking can manifest in different ways, including Romeo pimps or "boy friending," "CEO pimping," familial trafficking, child trafficking, online exploitation, survival sex, exploitation of addiction or disabilities, and involvement with gangs. Sex trafficking is also entwined in adult sex work and other sexual-economic activities that have an elevated risk for violence and restrictions to individual's freedom (Kempadoo, 2007; Izcara-Palacios, Moral-De-La-Rubia, & Andrade-Rubio,2017; Forcinito, 2013). It is crucial to note that many individuals involved in sex trafficking situations may not perceive themselves as victims due to the grooming and manipulation tactics employed by traffickers to coerce their participation in commercial sex (Polaris, 2022).

Labor trafficking, as defined by the National Human Trafficking Hotline, involves individuals being compelled to perform labor or services through the use of force, fraud, or coercion (2019). It encompasses various forms such as debt bondage, forced labor, and involuntary child labor. Exploitative conditions in labor trafficking can include no pay or wages lower than market rates, disregard for safety regulations and labor laws (e.g., OSHA safety violations), and excessively long work hours without appropriate breaks. Surprisingly, labor exploitation often receives less attention in research, despite affecting a significant number of people (Seelke, 2013). Victims of labor trafficking are often controlled through force, manipulation, and fear, making it difficult for them to voice complaints or seek help (Seelke, 2013; Torres Artega, 2014; Kempadoo, 2007). Despite being

aware of the illegality of such exploitation, victims often fear losing their jobs and disrupting the economic stability of their families back home.

IHT Data

Despite attempts to gather comprehensive information on IHT, there is still a need for improved data quality to enhance our understanding of international movement patterns. While the United States made significant strides in data collection in 2008 with the enactment of the Trafficking Victims Protection Reauthorization Act (TVPRA of 2008), data collection practices remain inconsistent across nations. Nevertheless, TVPRA played a crucial role in raising awareness of this issue by expanding anti-trafficking prevention strategies and offering protections through the T Visa. Additionally, it mandated the screening of all unaccompanied alien children as potential victims of human trafficking (Department of Homeland Security, 2022). These initiatives have led to a better comprehension of trafficking networks associated with the United States.

Data Quality

One of the ongoing challenges in studying human trafficking is the lack of universal standards for identifying and collecting information about victimization, despite IHT being recognized as a crime by most nations. This inconsistency makes it difficult to obtain accurate and comprehensive data. For example, within the United States, official records from the Office of Justice Programs indicate a 14 to 18 percent discrepancy in victim counts (2019). While the UNODC has made efforts to address this issue by aggregating information from member nations, concerns about data coverage persist.

According to the UN Data website (2023), the data is derived from official statistics provided by countries and compiled by the United Nations data system, along with estimates and projections. The website also states availability of data from certain countries may be limited for various reasons, such as those countries not being linked to the UN or not providing data for specific indicators.

Currently, researchers studying country-to-country human trafficking networks have two options for data sources. The first option involves aggregating origin and destination information from each nation located withing a study region. This option can provide a more comprehensive data set by including countries that do not report their IHT statistics to the UNODC. However, this source has the disadvantage of lacking standardized or consistent data elements since each country collects information based on its own purposes. Also, definitions of human trafficking may vary across countries, as well as the classification of victim status and the types of human trafficking.

The second option is to utilize archived public data, such as the human trafficking archive maintained by the UNODC. According to the UN Data website (2023), this data is derived from official statistics produced by countries and compiled by the United Nations data system. The main benefit to using this data is that it follows standard protocols, including common definitions and inclusion criteria. However, this source has two significant limitations. First, data coverage is limited because contributions to the archives are voluntary for member states. Second, the information each nation contributes may be constrained by definitional requirements, potentially leading to variations in the data contributed

(e.g., if a country does not align its definition of human trafficking with UNODC specifications).

This methodological dilemma serves as the motivation for the current study. By comparing the two data sources, this study aims to determine which source is better suited for mapping country-to-country IHT networks.

Study Focus

The study relied on secondary data and used specific data collection protocols, described in future sections, to gather information on reported human trafficking cases in all countries across North, Central, and South America, as well as the Caribbean (see FIGURE 1). Data were also collected on IHT victims through the United Nations Office on Drugs and Crime (UNODC). The primary objective of the study was to examine potential variations in data quality and content based on the data's source of origin and the impact of data categories and classifications on our understanding of IHT movement patterns.

Figure 1 America Continent with Political Division

Outline

This thesis comprises four additional chapters that contribute to the overall research:

Chapter Two focuses on reviewing relevant academic literature on IHT. It examines the characteristics of transnational movement in the Americas, considers the geographic context and political stability within the region, and

justifies the decision to focus on a specific region instead of a global study approach. Additionally, this chapter explores how data quality, particularly missing data, can influence network analysis.

Chapter Three details the methodology employed in the study. It provides an overview of the research design and the primary data source. The chapter describes the study area and introduces both network data sources. It also outlines the study's timeframe and provides a description of the sample. The methodology section further explains the analytical strategy, covariates, and the structural changes and nodal attributes utilized in the analysis.

Chapter Four presents the results of the study. It begins by discussing the stability of patterns and the positional importance of countries within both data sets over time. The chapter then delves into describing the structural characteristics and positional importance of countries within the network. Finally, it presents the findings derived from Quadratic Assignment Procedure (QAP) regression models.

Finally, Chapter Five discusses the implications of the research. It explores the practical implications of the study's findings and their potential impact on addressing IHT. Additionally, the chapter highlights the challenges and limitations encountered during the research process. Lastly, it provides suggestions for future research directions and areas that warrant further investigation.

CHAPTER TWO:

LITERATURE REVIEW

Introduction

This chapter is structured as follows. First, it provides an overview and explanation of international human trafficking (IHT) in the Americas. Next, the chapter explores the current state of data quality pertaining to human trafficking, highlighting the increased attention this issue has received from countries. The following section explores how the geographic context, specifically border connectivity, and political instability, such as conflicts, can impact the estimation of IHT patterns over time. The chapter then goes on to address the challenges posed by missing data and presents a review of the relevant literature on social network analysis as well as potential approaches to address and resolve the issue of missing data. Finally, the chapter concludes by presenting the research questions being investigated in the study.

Human Trafficking in the Americas

The Americas, the second largest continent in the world, consists of 35 countries grouped into four distinctive geographic regions. Most countries in North, Central, and South America share land borders, while some are island nations forming the Caribbean region (see FIGURE 2 for the geographic division).

Figure 2 Distinct Geographic Regions in the Americas.

According to the UNODC data depicted in FIGURE 3, detected levels of victimization from human trafficking in 2010 had a higher concentration in the

northern regions of the Americas. One can also see overall concentrations were relatively lower in the Americas when compared to Asia, Europe, and parts of Africa (FIGURE 4). However, as mentioned before, these numbers can be deceiving.

Figure 3 IHT in the Americas According with the UNODC in 2010.

Source: The Annual United Nations Crime Trend Survey (UN-CTS)

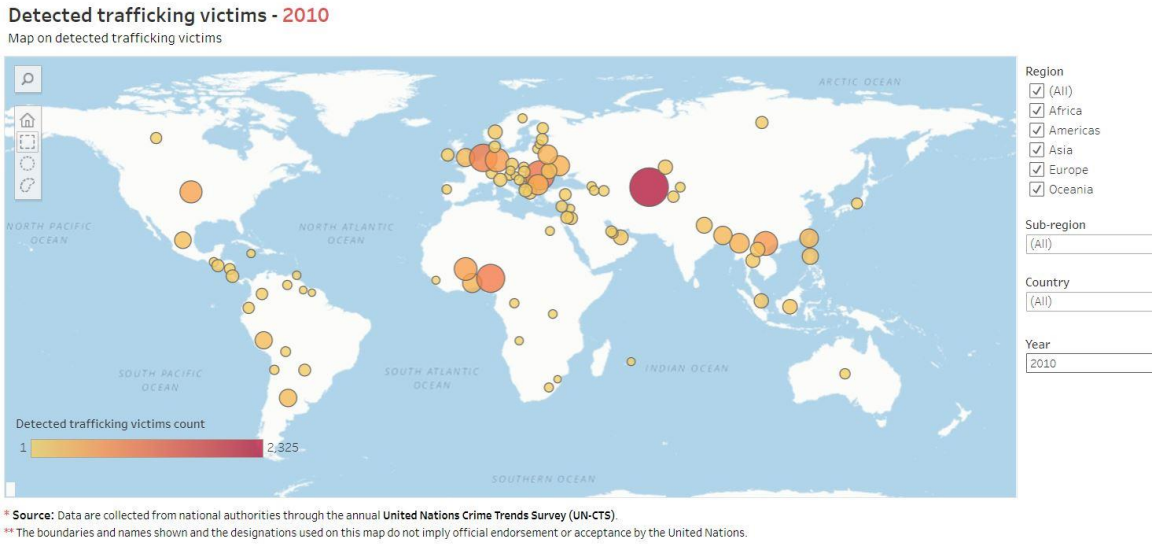


Figure 4 IHT in the World by UNODC in 2010

Source: The Annual United Nations Crime Trend Survey (UN-CTS)

Multiple researchers argue that while estimates may fluctuate from year to year, there is a substantial population at risk and vulnerable to human trafficking in modern society, and this population is not diminishing (Konrad et al., 2017; U.S. Department of State, 2013). Notably, one report suggests that less than 1% of the estimated number of trafficked individuals have been identified (U.S. Department of State, 2013). These investigations indicate there may be a significant gap between the estimated number of people subjected to trafficking, the number of identified victims, and the number of individuals arrested for involvement in human trafficking.

There are several arguments that explain why reports of human trafficking underrepresent the actual extent of victimization:

First, as emphasized by Forcinito (2013), violence and organized crime have become normalized in Latin America and the Caribbean. Furthermore, exploitation in these regions is widespread because of their interactions with organized crime during the immigration process (Seelke, 2013). This is because when individual's cross borders from South America, intending to reach the United States, they end up becoming victims of human trafficking and often fail to reach their intended destination (Forcinito, 2013).

Second, multileg journeys that involve transfers through intermediate nations make it challenging to trace the movement of trafficking victims. For instance, Caribbean nations are frequently used as connection points for trafficking into Mexico and the United States (Caribbean Migration Report, 2019). South American countries serve as transfer points for trafficking victims from Asia and Europe to other destinations in the Americas and beyond (Kempadoo, 2007; Issa, 2017). Victims originating in South America often pass through Central America and Mexico. While some research emphasizes North America as a primary destination (Reid, 2012; Finckenauer & Schrock, 2000), others indicate that South America also has a significant number of trafficking victims (Ribando, 2010).

Lastly, a disproportionate amount of human trafficking involves sex trafficking of marginalized individuals. For example, according to the 2019 report by the Polaris Project, there were 14,597 identified individual victims and survivors of sex trafficking, 4,934 individual victims and survivors of labor trafficking, and 1,048 individual victims and survivors of sex and labor trafficking

in the United States (Polaris, 2019). In many Latin American countries, victims of sexual crimes are devalued. If victims are also involved in the sex industry through illicit activities, even if they are forced to work, society and their communities may not recognize sex trafficking as a crime due to the association with these illicit activities.

Improving Data Quality

Previous studies have identified three key factors that influence the success of efforts to improve data quality:

1. National and international attention to the issue of human trafficking plays a crucial role in fostering the development of better-quality data over time (Davy 2016; van Dijk and van Mierlo 2014).
2. Regional initiatives aimed at understanding trafficking activities help focus data collection efforts on specific areas, leading to more complete and informative data for those regions (Giommoni, Aziani, Berlusconi, 2017; Sands, 2007; Trumbore & Woo, 2014; Wyler & Cook, 2011).
3. Political and economic instability can have a negative impact on data collection efforts, as it may impede the gathering of complete and high-quality information (Horne and Barney, 2019; Ulasoglu Imamoglu, 2021).

Difficulty in obtaining reliable and comprehensive data is not exclusive to human trafficking but is also encountered in the study of organized crime as a whole. For example, according to Daniele & Marani (2011), who sought to

quantify the territorial extent of organized crime, they found data often require improvement and the number of reported incidents tends to underreport the true scale of the phenomenon. This highlights the challenges researchers face in obtaining accurate statistics and reliable data to inform their studies.

Increased Attention to the Issue

Multiple studies conducted in various areas of research, including organized crime, indicate that data quality tends to improve over time, leading to a better understanding of criminal activities. This trend also applies to the study of human trafficking, with data collection efforts showing improvement, particularly since the development of anti-human trafficking programs in the 2000s.

For instance, a study by Davy (2016) revealed an increase in the quality of evaluations of anti-human trafficking programs. This study focused on how improvements in IHT programs were implemented. These improvements ensured that programs were effectively targeting, implemented, and delivered to the right demographic. This ultimately enhanced our knowledge regarding their impact on these populations. The use of evaluation programs as a data source in the study of international human trafficking is crucial, as much of the available data is derived from program reports. However, it is important to acknowledge that such reports can introduce variations in data collection policies and standards, which need to be carefully considered.

Additionally, van Dijk and van Mierlo (2014) conducted a study focusing on the analysis of reports on anti-human trafficking measures conducted by the

United States State Department. These annual reports rank countries based on their efforts to combat human trafficking according to U.S. legislation standards. This study demonstrated that quantitative ratings of anti-trafficking policies can be technically achievable over time. These quantitative ratings not only serve as a basis for evaluations and rankings but also enable the exploration of hypotheses about anti-trafficking policies and validation of findings from previous studies. Given that the present study utilizes two data sources, each with its own data quality standards and quantitative measures, this validation becomes crucial (Van Dijk, Van Mierlo, 2014).

Geography

Geography connectivity plays a key role in IHT, factors such as geographic proximity, border connectivity, country size, and positional importance influence the movement of trafficking networks between countries (Giommoni, Aziani, Berlusconi, 2017; Sands, 2007; Trumbore & Woo, 2014; Wyler & Cook, 2011). Geographic proximity and topographic features have been observed to facilitate the use of a country as a transit state in IHT operations (Giommoni, Aziani, Berlusconi, 2017). The distance between nations and the number of borders a country shares with others, known as border connectivity, impact the ease of movement and the options available for trafficking routes (Boivin, 2014; Maftei, 2012). Moreover, the size of a country can influence trafficking operations, as larger countries may allow traffickers to reach their intended destination without crossing multiple international borders (Maftei, 2012). Positional importance also plays a role, as countries located along

traditional trafficking routes act as entry points into important regions which can be a significant factor in facilitating human trafficking activities (Maftei, 2012).

However, findings regarding the importance of geographic proximity in IHT are not conclusive. One the one hand, some researchers argue that it is a crucial factor in determining whether a country is used as a transit state (Berlusconi et al., 2017; Giommoni et al., 2017; Leuprecht et al., 2014; Trumbore & Woo, 2014; Wyler & Cook, 2011). On the other hand, there are arguments suggesting that advances in transnational logistics and the complexity of trafficking networks can diminish the significance of geographic proximity (Trumbore & Woo, 2014; Ekici & Ozbay, 2013). These varying viewpoints are often influenced by the quality of the data used to assess the importance of border connectivity. For example, if a country has a high number of reported victims being rescued, it indicates the significance of its border and its role as a transit or destination country for IHT. Conversely, if there are no reports, it suggests that connectivity may not be a significant factor in that particular context.

Political Instability

The issue of human trafficking has gained significant attention globally, as it represents a grave violation of human rights. Despite efforts for international cooperation in combating trafficking in persons, differences in national anti-trafficking policies and practices hinder the effectiveness of these collaborative efforts. Conflict within or between nations is identified as a risk factor that increases the vulnerability of individuals to become victims of human trafficking (Horne and Barney, 2019).

During civil conflicts or wars, people are more likely to seek to escape their countries, exposing them to higher risks of becoming victims of trafficking, as noted by Horne and Barney (2019). The relationship between peacekeeping efforts and trafficking is an area of ongoing research, as conflicts create conducive conditions for increased trafficking victimization. In countries affected by active conflicts, the range of push and pull factors heightens the vulnerability of individuals to trafficking. Ulasoglu Imamoglu (2021) further argues that limited resources during civil conflicts are primarily allocated to winning the conflict itself, leaving insufficient resources for detecting and combating human trafficking. Also, this resource scarcity makes it easier for such crimes to occur. Understanding this connection is crucial for addressing and mitigating the impact of trafficking on conflict-affected populations.

Missing Data and Social Network Analysis

In any research on crime, it is important to acknowledge that complete data on criminal events is impossible to obtain. Researchers must consider and address the impact of missing data on their findings. Social network analytics, if applied effectively and with consideration for data challenges, can help identify structural vulnerabilities in transnational crimes, thereby providing valuable insights for crime control efforts aimed at disrupting criminal networks (Bichler & Jimenez, 2023).

When utilizing social network analysis, missing data can introduce bias and affect the observed characteristics and stability of the network. Kossinets

(2006) highlights the sensitivity of relational data, as it requires information on both actors (individuals or entities) and ties (relationships between them) for accurate representation in the data. A complete set of actors and their relationships is necessary to map the structure and characteristics of the network. If a relationship is missing but the actor is present, there is less bias in the network estimates compared to when an actor is missing. However, if an actor is missing, all their relationships are also missing by default. This can significantly bias network-level statistics and potentially lead to misinterpretation of the network's properties (Kossinets, 2006).

Therefore, researchers should carefully consider the implications of missing data in their social network analysis, employing appropriate techniques to handle missingness and minimize potential biases. By addressing missing data issues, researchers can enhance the validity and accuracy of their network analyses, leading to more robust and reliable findings.

Research Questions

Drawing upon prior research, this study compares the observed structures of networks generated from different data sources with the aim of identifying which is likely to reflect higher quality data (Bichler, & Malm, 2013; Bright, Malm, & Koskinen, 2018; and Bichler & Jimenez, 2023). Asking three questions, this study investigates two sources of IHT to determine whether higher quality data can be identified using three characteristics – completeness of observed

networks, stability of positional metrics, and realism of movement patterns. Three questions drive this study.

Prior literature supports the argument that higher quality data generates more complete networks. More complete networks should be larger and exhibit complex patterns of interconnectivity indicative of the complex and evolving socio-economic, political, and criminological landscape of each region investigated (Horne and Barney, 2019; Ulasoglu Imamoglu,2021). These complex patterns should reflect multiple source and destination countries (Giommoni, Aziani, Berlusconi, 2017) w. many travel corridors. For example, Venezuela is facing three different crisis that includes the humanitarian emergency, rebellion of citizens, and the massive migration, all this increased the likelihood of increased of immigration increasing the risk of victims of IHT and because of the government control and rebellion of citizens the reports are lacking information or they are not being recorded at all (Venezuela, Country Page-Human Rights Watch. 2022). Thus, the first question explored in this it is as follows.

(Q1) Compared to UNODC data, will the original source compilation generate more complete networks?

A positional analysis of country-to-country movement should reveal which countries have the greatest impact on the network. Degree centrality measures the number of connections or interactions that the country has within the network. Research shows that social networks exhibit non-normal distributions where a

small number of nodes have high influence on others in the network (Wasserman & Faust, 1994). This implies that each country should exhibit different relative positions within the network and a few countries should be highly ranked. This study raises the following question.

(Q2) Compared to UNODC data, will the original source compilation identify the same influential source and destination nations?

As described above, since countries in this region exhibited varying levels of stability, it is likely that the networks will evolve over time. Socio-economic conditions evolve, shifting the locus of push and pull factors underscoring human migration. IHT patterns tend to mimic human migration patterns (Maftei, 2012; Ulasoglu Imamoglu 2021) This implies that when conditions change (i.e., a new conflict ensures or a fiscal crisis occurs), there should be corresponding changes in the observed network. For example, source and destination country designation should not covary with border connectivity, but it should vary with involvement in armed conflict. Thus, this study asks the following question.

(Q3) Compared to UNODC data, will the original source compilation produce more realistic estimates of IHT that reflect an evolving pattern of interconnectivity among countries?

CHAPTER THREE:

METHODOLOGY

Introduction

This chapter is structured as follows. It begins by discussing the data management strategy, which includes providing an overview of the study area, the designated time frame, and the selected data sources. Next, the chapter details how human trafficking cases will be utilized to generate directed, valued networks between countries. This chapter then explains the analytic framework use to compare data quality on three dimensions – network completeness, stability in positional metrics, and realism of movement estimates

Study Area

This investigation encompassed all 35 countries in the Americas, including North America, Central America, South America, and the Caribbean (see TABLE 1 for the distribution of the countries by area). The decision to focus on the Americas was motivated by several factors. Firstly, the spatial proximity and shared borders among countries in each region create interconnectedness in terms of border security, economics, and culture, which can facilitate cross-border movement and human trafficking (Pearce, 2010; Shelley, 2012). High crime rates and the prevalence of drug trafficking in certain countries in South America and Central America, along with high poverty levels, increase the

vulnerability of individuals to become victims of human trafficking as they seek better living conditions by crossing shared borders.

Table 1 Total of Countries by Region

Region	Total	Percentages
Caribbean	12	34.3%
Central America	7	20%
North America	3	8.6%
South America	13	37.1%

Secondly, the United States has become a major destination for trafficking activities, resulting in significant crime control efforts such as the Trafficking Victims Protection Act (Laczko, 2005). Estimates suggest that a substantial number of people, ranging from 14,500 to 17,500, are trafficked into the United States annually (Laczko, 2005). Given the United States' position as a strong economy within the Americas, it likely plays a crucial role in human trafficking patterns in the region.

Lastly, conducting a global investigation extending beyond the Americas would pose substantial challenges in terms of resources and methodological complexities. According to Data and Research on Human Trafficking (2006), globally representative human trafficking databases and archives are still in their nascent stage of development. Compiling human trafficking data for all 197 countries would require extensive resources and language skills. Additionally, political instabilities in various regions of the world and the national resources

required to detect human trafficking would likely result in missing data, posing a substantive validity threat if the present study were extended. Focusing on a smaller, geographically proximate study area with a limited number of official languages improves the feasibility of the research and reduces methodological concerns (Data and Research on Human Trafficking, 2006).

Network Data Sources

Original Source Compilation

The first set of data in this study consisted of aggregated incident-level information on labor and sex trafficking. While English is the primary language used for reporting on international human trafficking, it is important to note that national reports are not always published in English. Excluding non-English sources would limit the comprehensiveness of the research (Issa, 2017). Therefore, to ensure the inclusion of as much data as possible, multi-language data collection protocols were implemented in this study. These protocols aimed to gather information from various languages to enhance the completeness and representativeness of the data.

Search terms. The search for data in this study was conducted in two languages: English and Spanish. The English search utilized the terms "human trafficking" or "data." However, due to the lack of standardized terminology for these terms in Spanish-language sources, different search terms were required. Common Spanish terms used included "trata de blancas," "explotación de personas," "esclavitud moderna," "trata de personas," and "tráfico de personas."

While the word "data" translates to "datos" in Spanish, this specific search term did not yield successful results. Instead, three variations of the term were used: "datos libres," "base de datos," "estadísticas," and "reportes estadísticos." The inclusion of multiple search terms in different languages increased the time needed to find relevant information. As shown in Table 2, despite the use of two languages in the search, reports in five different languages were uncovered.

Translation. Data collection for this study involved the use of translation protocols. As many reports were only available in the official language of the respective countries, it was necessary to translate them into English or Spanish. Google Translate was utilized to translate data reported in French, Portuguese, and Dutch into English or Spanish when no other translation option was available on the website. Additionally, all Spanish reports were translated into English. The author of this study is also a native Spanish speaker, which facilitated the translation process and ensured accuracy in the interpretation of the data.

Table 2 Native Languages for Reported Data

Main Language	**Total**	**Percentages**
Spanish	*18*	*51.4%*
English	*11*	*31.4%*
English/French	*2*	*5.7%*
French	*1*	*2.8%*
Dutch	*1*	*2.8%*
Portuguese	*1*	*2.8%*
English/Spanish	*1*	*2.8%*
Gran Total	***35***	***100%***

Availability. While many countries collect information on specific incidents, the data are commonly reported at the aggregate level (see TABLE 3).

Typically, these annual reports include information on the gender, age, and citizenship of the victims, as well as the type of exploitation they experienced, their relationship to the trafficker, and the country where the exploitation took place.

Table 3 Type of Data Collection and Language.

Report Language	**Number of Countries**	**Type of Data**	
		Aggregated	***Incident***
English	*19*	*18*	*1*
Spanish	*16*	*15*	*1*
Total	*35*	*33*	*2*

Victimization data in this study were collected when victims were rescued or apprehended during their travel or through interactions with law enforcement or healthcare providers. The data were primarily retrieved from digital archives, including formal reports and other initiatives aimed at disseminating official data or raising awareness about victimization. In some cases, data were compiled from multiple sources to ensure a comprehensive data set. For example, in Canada, two sources of data on human trafficking were utilized: a government website that recorded interceptions and a website that collected information from self-reports of victims. Data availability varied across countries, but most nations in the Americas started consistently recording data on human trafficking from

2008 onwards. Further details about the organizations involved in collecting and disseminating human trafficking data can be found in TABLE 4.

Table 4 Report Producer

Disseminating Organization	***Frequency***	***Percentages***
Government	19	48.8%
Data Website	8	20.5%
Police	5	13.0%
Private Organization	3	7.7%
Self-Report	2	5.1%
Health Department	1	2.5%
Human Trafficking Website	1	2.5%
Total	**39**	**100%**

UNODC Data

The other source of information in this study is the dataset produced by the United Nations Office on Drugs and Crime (UNODC), which is widely used in the field of human trafficking research. UNODC is a global organization dedicated to combating illicit drugs, international crime, and various forms of abuse, including human trafficking. Their data collection efforts focus on gathering information on trafficking, drug abuse, crime prevention, criminal justice, terrorism, political corruption, and related issues (UNODC, 2022).

The available years for the data used in this study range from 2005 to 2017. However, it is important to note that there were significant data gaps for the years 2005 to 2007, with a lack of data specifically for the countries in the Americas. Data availability for the Americas started to become more consistent from 2008 onwards. This year marked a turning point where more countries in the Americas began contributing data to the UNODC, resulting in a more comprehensive data set for the region.

Sample Description

Coverage. Original data for the study were obtained from most countries in the Americas, with aggregate data available for 33 out of the 35 countries (94.3%). However, when considering the UNODC data, which is a global dataset, only 12 of the reporting countries belong to the Americas, representing 6.1% of the region's countries. This indicates that the source compilation used in the study covers a greater geographic coverage of the Americas compared to the UNODC data.

It is important to note that the comprehensiveness of the UNODC data is dependent on the willingness of member states to report information in a manner consistent with the UN's requirements and filters for data compilation. The UNODC recently made changes to its human trafficking data portal in February 2023, which included the addition of more detailed information about the victims and the type of trafficking. However, at the time of data download for this study, the available UNODC data was aggregated and lacked such details. Therefore, it

is essential to recognize that the characteristics of the downloaded data, in terms of representativeness and completeness, may differ from the current data available on the revised UNODC portal.

Time Frame. The time frame chosen for this study was from 2008 to 2017, spanning a period of 10 years. This decision was made for two reasons. Firstly, it was important to select a time frame that allowed for maximum overlap in comprehensive reporting periods between the two data sources, thereby minimizing the issue of missing data and enabling a more meaningful comparison between the datasets. For example, agency reports from Nicaragua covered the years 1998 to 2015, while the UNODC data extended from 2005 to 2017. By selecting the years 2008 to 2017, a substantial portion of the available data from both sources was captured (see FIGURE 5).

Secondly, the decision to exclude data from 2019 to 2021 was made to mitigate the analytical complexities associated with the impact of the COVID-19 pandemic on the movement of people. The pandemic brought about significant disruptions and changes in global mobility patterns, which could confound the analysis and interpretation of the data. By focusing on the years prior to the pandemic, the study aimed to minimize the potential influence of these exceptional circumstances on the findings.

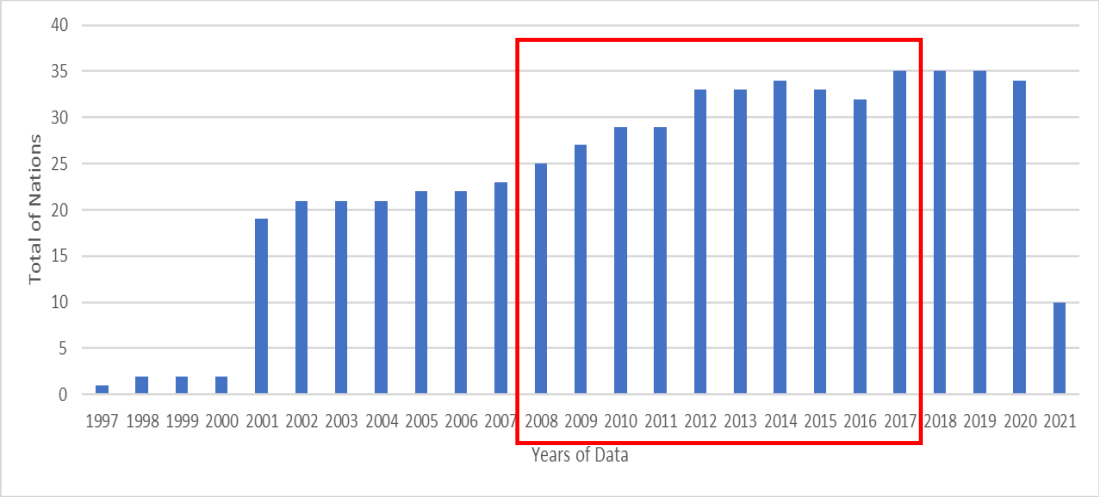


Figure 5 Variation of Data by Years Available

Network Generation

The analysis required the generation of 10 networks for each data source, resulting in a total of 20 networks. The first set of 10 networks was created from the original compilation of sources, while the second set was derived from the data downloaded from the UNODC.

In each network, connections were established between pairs of countries based on reported instances of human trafficking between them during the observed year. These connections were valued, reflecting the number of years the trafficking relationship was observed between the countries. Connections for all networks were valued to reflect the number of years the relation was observed between the countries. Annual networks were not valued, which means that an IHT path or movement channel existed between the pair of countries, or it did not.

The networks are directed, meaning that the ties or connections link the origin country to the destination country. It is important to understand that these directed ties do not necessarily indicate a reciprocal relationship between the countries. For example, if country "A" is connected to country "B," it does not necessarily mean that country "B" is also connected to country "A." The flow of human trafficking paths may be unidirectional, with movement occurring from one country to another without a corresponding movement in the opposite direction.

Analytic Strategy and Metrics

The focus of this study is to compare data sources on the quality of information captured on human trafficking occurring throughout the Americas over time. Data quality is assessed on three dimensions – network completeness, stability in positional metrics, and realism of movement estimates (Borgatti, Everett, & Freeman, 2002). All network metrics were calculated with UCINET 6.

Network Completeness

In this study, network completeness is assessed through comparative analysis of the observed size and overall structures of the networks for each year. The network metrics used to examine different aspects of the network in this study are as follows:

Size: The number of nodes and ties observed in the network provides a measure of its general size. In this study, the nodes represent individual countries, and the ties represent the existence of an IHT path between countries. More complete networks are expected to be larger.

Arc Reciprocity: measures the exchange of ties between two nodes, indicating whether there is reciprocity in the IHT paths between countries. If a tie exists from country X to country Y, and there is also a tie from country Y to country X, it demonstrates arc reciprocity. Bidirectional channels (reciprocal arcs) are expected when information is more complete.

Overall Clustering Coefficient: represents the tendency of nodes (countries) to cluster together in the network. It measures the degree to which countries tend to have connections with other countries that are also connected to each other. It is expected that a more complete network would exhibit greater clustering as subregions of dense interconnectivity are observed.

Average Degree: calculates the average number of IHT paths observed for each country in the network. It provides an indication of the average level of connectivity of countries in terms of IHT flows. It is expected that a more complete network would expose multiple travel routes to and from countries in the network.

Out-Centralization: measures the proportion of outgoing IHT paths emanated from the most central nations. Ranging from 0 – 1, a score of 0 indicates that no nations dominate the IHT flow (all nations are origins), whereas a score of 1 indicates that one nation is observed to be the origin of all IHT flow (star formation or maximally central). Given that many nations contribute IHT data for each source, observing a high out-centralization might indicate that a nation's experience or information contribution excessively influences the

observed network. Low out-centralization is expected as there should be many source countries.

In-Centralization measures the proportion of upcoming IHT paths emanated from the most central nations. Ranging from 0 – 1, a score of 0 indicates that no nations dominate the IHT flow, whereas a score of 1 indicates that one nation is observed to be the receiver of all IHT flow. Given that many nations contribute IHT data for each source, observing a high in-centralization might indicate that a nation's experience or information contribution excessively influences the observed network. Low in-centralization is expected as there should be many destination countries.

Positional Importance

Degree centrality measures the number of connections or interactions that a node (country) has within the network, and it has been shown to indicate the influence of a node on the network (Wasserman & Faust, 1994). These connections can be measured by in-degree and out-degree centrality. Figure 6, panel a, illustrates that in-degree centrality measures the number of edges (interactions) in which a node is a receiver (Wasserman & Faust, 1994; Borgatti et al., 2002). In contrast, panel b of the figure illustrates that out-degree centrality measures the number of edges in which the node is the sender (Wasserman & Faust, 1994; Borgatti et al., 2002). In this study, degree centrality accounted for the number of interactions experienced by countries within the network. In-degree centrality accounted for the number of times a country received human trafficking victims, while out-degree centrality accounted for the number of times

the country sent victims of human trafficking to other countries. At an individual level (countries), positional importance within a country-to-country network should change because IHT is influenced by the dynamic nature of the socio-political landscape of the study region.

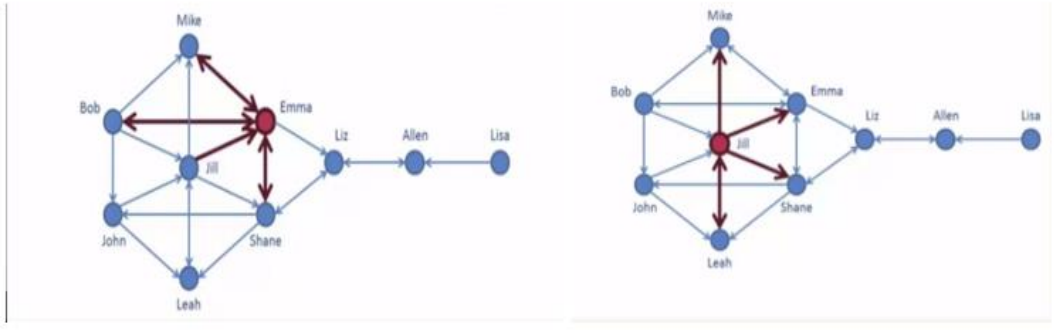


Figure 6 Degree Centrality

Source: Ravinderkhatri. (2014, December 13).

Realistic Estimates

Structural change is an important variable as it helps to compare the UNODC data and the original compilation data. More realistic networks are expected to exhibit some evolution in the overall network that tracks changes in economic and political crises related to migration patterns rather than remaining stable.

Jaccard: Jaccard's Similarity Index is a statistic used to test the similarity and diversity of sample sets, calculating the similarity between two sets of data.

Developed by Paul Jaccard, the index ranges from 0 to 1, with a value closer to 1 indicating greater similarity between the two sets. By comparing the members or actors from both data sets, the Jaccard Similarity Index assesses the stability similarity between the years. This variable is important in this study as it helps understand which data source (UNODC vs. Original Compilation Source) provides a more realistic estimate of the movement of people. Stability, as indicated by the Jaccard Index, demonstrates how the connections between countries grow or change over time and whether these changes align with the number of detected victims. It is expected that networks from two consecutive time periods will show low similarity if there has been change in the conditions that facilitated IHT within the study region.

Quadratic Assignment Procedure Quadratic Assignment Procedure (QAP) was utilized to control for factors that may influence the realism of estimates. QAP was run in UCINET 6, involving a two-part process. An initial regression was followed by multiple permutations to account for standard error (Hanneman & Riddle, 2011). QAP is an ideal method for this study as it recognizes that the actors involved in the network are not necessarily independent from one another (Hanneman & Riddle, 2005). Regression analysis helps assess covariance that predicts an aspect of network structure.

Two covariates, border connectivity and conflict, were utilized to examine the factors that influence the detection of IHT. Border connectivity refers to the number of countries sharing borders and the total length of those shared borders. Boivin (2014) highlighted that countries with a higher number of shared borders

often have greater profits and lower risks in comparison to countries with fewer borders. Also, based on data quality considerations, countries with higher border connectivity are expected to have better data quality due to multiple countries involved in reporting cross-border movements. Conversely, countries with lower border connectivity may have lower data quality due to a smaller number of reporting countries or limited information detail. The data for this variable was obtained from the World Factbook, which collects information on various aspects of each country. The extent of border connectivity in terms of kilometers shared with neighboring countries can impact the number of reported victims. More information on border connectivity can be found in the geography section of TABLE 5.

Conflict, the second covariate, is measured by the estimated number of internally displaced persons (IDPs) in each country per year. Horne and Barney (2019) established a strong relationship between human trafficking victims and individuals displaced due to conflict in their home countries. Data for this variable was sourced from the Internal Displacement Monitoring Centre, which collects information on the total number of people displaced by conflict at specific time points. It monitors movements throughout the year, including those who have been unable to return home and individuals displaced in previous years. The available information on conflict-related movements provides insights into the likelihood of people moving outside their country due to conflict, consequently increasing the risk of falling victim to human trafficking. By examining the data on conflict-related movements and rescued trafficking victims, a more realistic

estimation of the number of reported victims by each country can be obtained. This allows for consistent monitoring and meaningful comparisons across countries and over time. Please refer to TABLE 5 for additional information.

Table 5 Nodal Covariates

Variable	**Description**	**Type of Variable**
Border connectivity	The individual lengths for each of the contiguous border countries.	Static
Conflict	IDMC use two main metrics the number of internal movement and the total number of internal displaced people.	Static

CHAPTER FOUR:

RESULTS

Completeness of Networks

Compared to the UNODC data, the original source compilation is expected to generate a more complete network. Table 6 provides a description of each network and the overall architecture of IHT observed throughout the full study period (all data). The reported metrics are commonly used to describe direct networks. This set of metrics reveals significant differences in the structural characteristics of IHT between the two data sources. Taken together, these descriptive metrics assist in estimating the comparative size, scope, and general structure of the networks.

The *number of nodes and ties* represents the network size. In addition to the size disparity, comparatively original source compilation generated a substantively larger network.

Arc reciprocity measures the proportion of observed IHT travel paths that occur in both directions, indicating that victims are trafficked into and out of both countries. Comparatively, when the original data is compiled, a higher level of arc reciprocity is observed for each network.

The overall clustering coefficient measures the level of clustering or clumping within the network, indicating how densely connected subareas of the network are. For example, if countries in Central America are observed to have more IHT movements with each other compared to other areas of the network, it

indicates higher clustering. In this analysis, the networks generated with UNODC data exhibited significantly higher levels of clustering. This suggests that the UNODC data may be more influenced by sets of reporting nations compared to the original source compilation.

Average degree centrality measures the average number of country-to-country IHT paths observed, regardless of the direction of travel. In comparison, both sources indicate an increasing number of IHT paths each year. However, the original source compilation reveals, on average, twice as many paths compared to the UNODC data.

Out and in-degree centralization measures the proportion of origin connections (source travel paths) associated with the most central nation, while in-degree centralization reports the proportion of countries sending people to the most popular destination country. The level of centralization varies significantly. The original source compilation exhibits a higher concentration of travel paths centered on destination countries, whereas the UNODC networks show higher centralization on origin nations. Additionally, the UNODC estimates are unstable, indicating that the composition of contributing nations significantly affects the observed networks.

Overall, Original source compilation produces more complete networks when compared to UNODC data. As explained above, the original source compilation generates larger networks, shows higher arc reciprocity, uncovers twice as many paths on average, and exhibits a concentration of travel paths on destination countries. However, UNODC data displays higher centralization on

origin nations, and more clustering within the networks, potentially influenced by sets of reporting nations.

Table 6 Network Description of Human Trafficking Reports (2008-2017)

Network Descriptors	**ALL DATA**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Original Compilation											
Number of Nodes/ Number of Ties	65/234	36/56	51/99	50/114	53/118	60/159	54/136	54/136	60/180	55/141	59/184
Avg Degree	3.60	1.56	1.94	2.28	2.23	2.65	2.52	2.52	3.00	2.56	3.12
Out-Centralization	0.19	0.10	0.08	0.10	0.09	0.13	0.11	0.13	0.17	0.14	0.16
In-Centralization	0.27	0.57	0.39	0.39	0.37	0.32	0.36	0.36	0.31	0.35	0.31
Arc Reciprocity	0.23	0.07	0.10	0.11	0.15	0.15	0.18	0.16	0.19	0.19	0.21
Overall Clustering Coefficient	1.58	0.50	0.33	0.30	0.30	0.25	0.27	0.28	0.25	0.30	0.27
UNODC											
Number of Nodes/ Number of Ties	105/265	25/31	25/33	28/44	32/47	32/43	84/125	89/138	31/46	27/45	15/21
Avg Degree	2.52	1.24	0.31	1.57	1.46	1.34	1.48	1.55	1.48	1.66	1.40
Out-Centralization	0.83	0.33	0.06	0.36	0.35	0.25	0.88	0.91	0.22	0.29	0.35
In-Centralization	0.11	0.12	0.03	0.17	0.08	0.18	0.09	0.06	0.15	0.17	0.19
Arc Reciprocity	0.12	0.00	0.06	0.04	0.04	0.04	0.03	0.01	0.08	0.08	0.00
Overall Clustering Coefficient	25.95	3.58	1.04	5.25	7.61	5.20	5.54	5.86	3.22	11.61	2.13

Positional Importance

While the previously reported whole network metrics offer a broad overview of the differences between the networks generated from each data source, it is also crucial to examine how the positions of central origin and destination countries vary.

Visual Analysis

Figure 7 showcases the complete network generated from the original compilation data, encompassing all the available data for the 10-year period. The network visually represents the structure of IHT by combining the data from multiple years. The size of the symbols corresponds to the out-degree centrality of each country, indicating the number of outgoing IHT paths. The thickness of the lines represents the frequency of observations for each tie, with thicker lines indicating more frequent observations. The arrowheads indicate the destination countries. It should be noted that the category "Foreign Countries" refers to IHT detections where information about the victim's origin is missing. In this network, the Dominican Republic, Venezuela, and Colombia stand out as central origin nations, depicted in red.

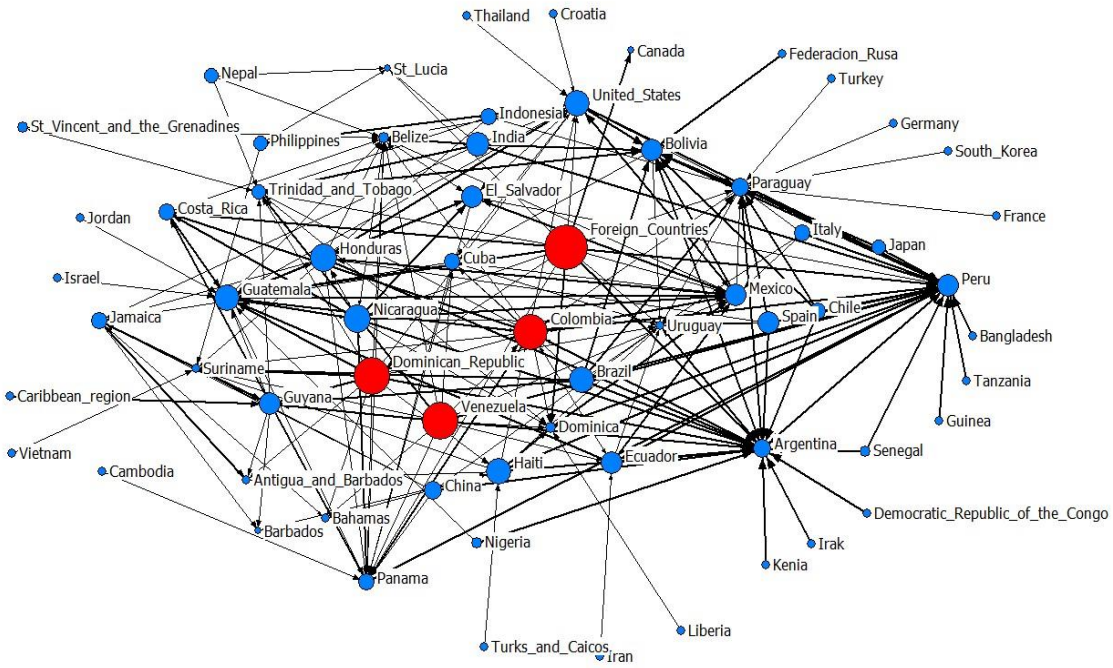


Figure 7 Out-Degree of Original Compilation All Data Network 2008-2017.

Figure 8 displays the networks generated from UNODC data, highlighting the substantial variation observed compared to the original compilation data. Similar to Figure 7, this network represents the complete architecture of IHT by combining 10 years of data. However, a notable difference is the dominant influence of one country in this network: the United States. The United States, due to its significant contribution to the UNODC archive, emerges as the most influential nation in terms of reported IHT channels. The most consistently reported trafficking routes involve the United States with Mexico and the United States with the Philippines. While other prominent nations are also depicted in red to indicate their high centrality, their scores are overshadowed by the relative impact of the United States on the network.

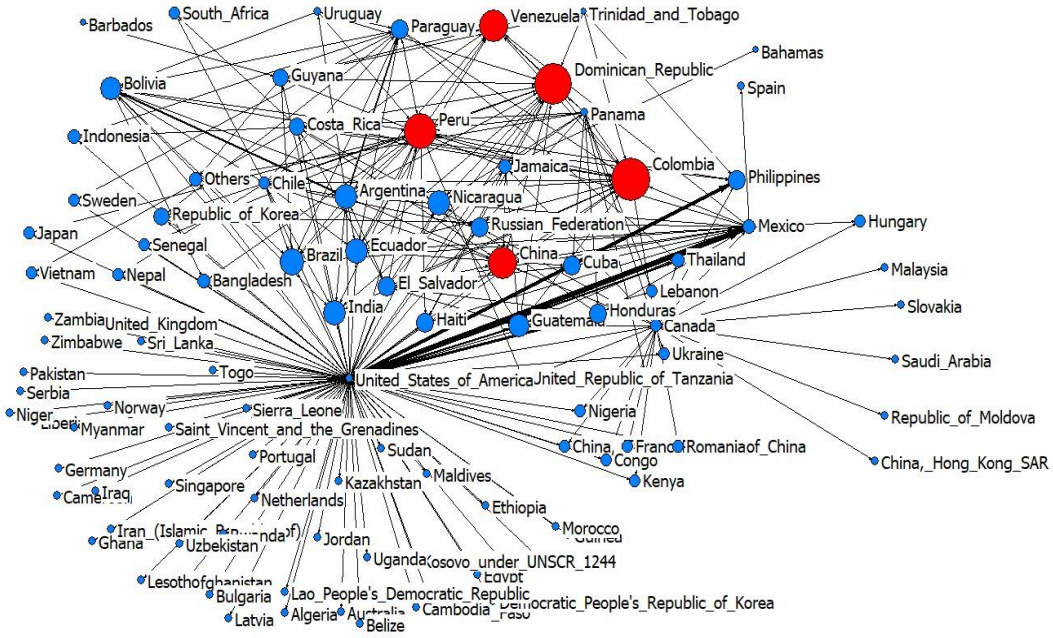


Figure 8 Out-Degree UNODC All Data Network 2008-2017.

Moving on to destination countries, Figures 9 and 10 showcase the 10 prominent destinations from each data source. In the case of the original compilation data, Argentina and Peru stand out as the most central countries. Additionally, the United States, Bolivia, Paraguay, Belize, Mexico, Uruguay, Guatemala, and Panama exhibit relatively high centrality in this network (Figure 9). Figure 10, on the other hand, displays the in-degree centrality for UNODC data, revealing a stark contrast. The United States emerges as the most central and dominant nation in the UNODC data network, overshadowing other destinations in terms of reported trafficking flows.

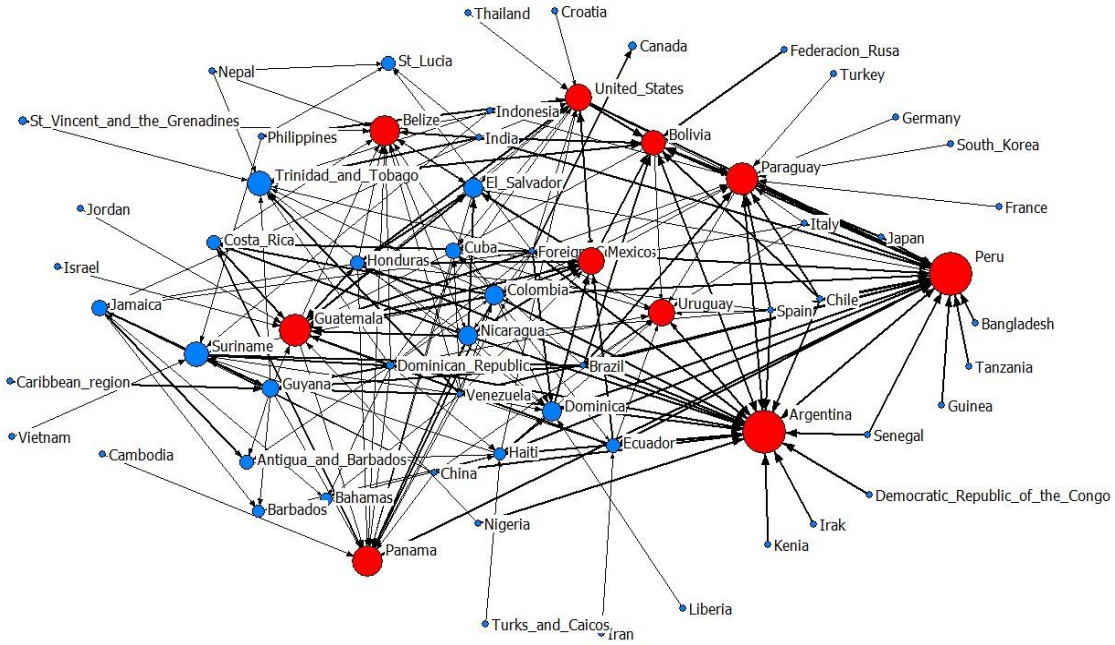


Figure 9 In-Degree of Original Compilation All Data Network 2008-2017

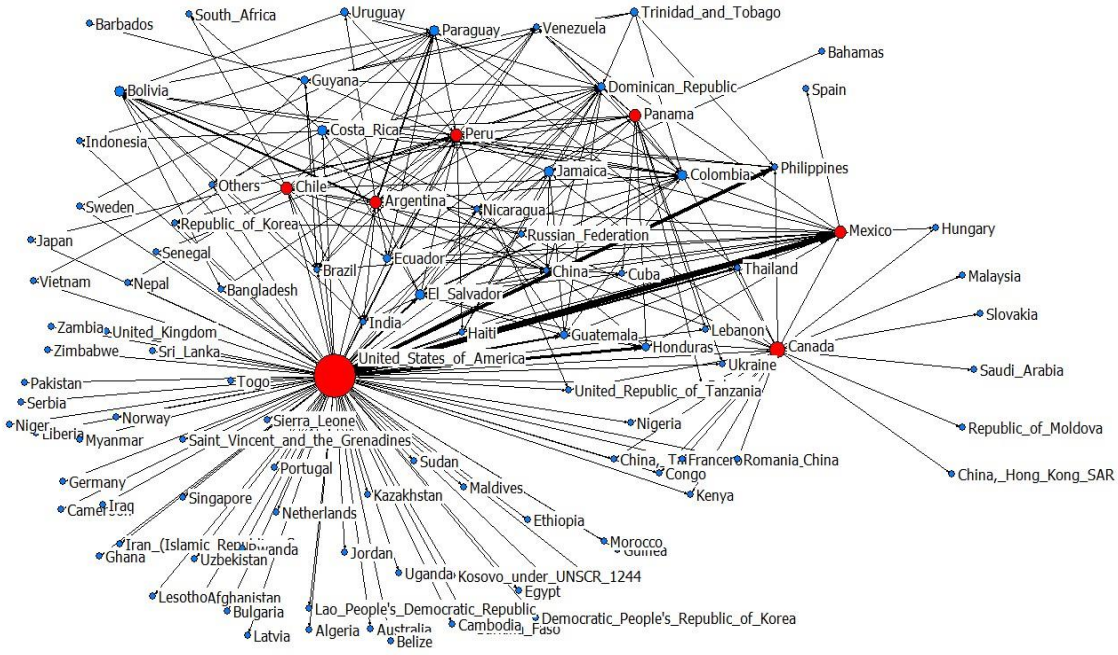


Figure 10 In-Degree UNODC Network 2008-2017

Comparing visual representations of these networks highlights that both networks are completely different and that the distribution and number of countries involved areas vary substantively.

Top Ten Analysis

The previous analysis has brought attention to a crucial issue: data sources present conflicting information about which countries have the greatest impact on the network. To delve deeper into this matter, the current analysis explores the top ten origin and destination countries according to each data source. Table 7 presents the top ten origin countries, revealing that Argentina exhibits the highest centralization in terms of reported victims in the original compilation data, while Mexico takes the lead in the UNODC data. Conversely, Table 8 displays the top countries that are more central as destinations for victims. In the original compilation data, foreign countries (unspecified destinations) follow by Colombia exhibit the highest centralization, indicating a higher number of reported victims being either destined for or rescued in these countries. In contrast, the UNODC data shows that the United States holds the most central position as a destination, with a higher number of victims being rescued in this country. One noteworthy observation from these tables is that the rankings and positions of countries vary depending on the data source, both for origin and destination countries.

Table 7 Top Ten Origin Countries Compilation and UNODC (2008-2017)

ORIGIN COUNTRIES	
Compilation	**UNODC**
Argentina	Mexico
Peru	Philippines
Bolivia	Honduras
Guatemala	Guatemala
Paraguay	Thailand
Mexico	Bolivia
Panama	El Salvador
Belize	Paraguay
United States	Colombia
Suriname	Dominican Republic

Table 8 Top Ten Destination Countries Compilation and UNODC (2008-2017)

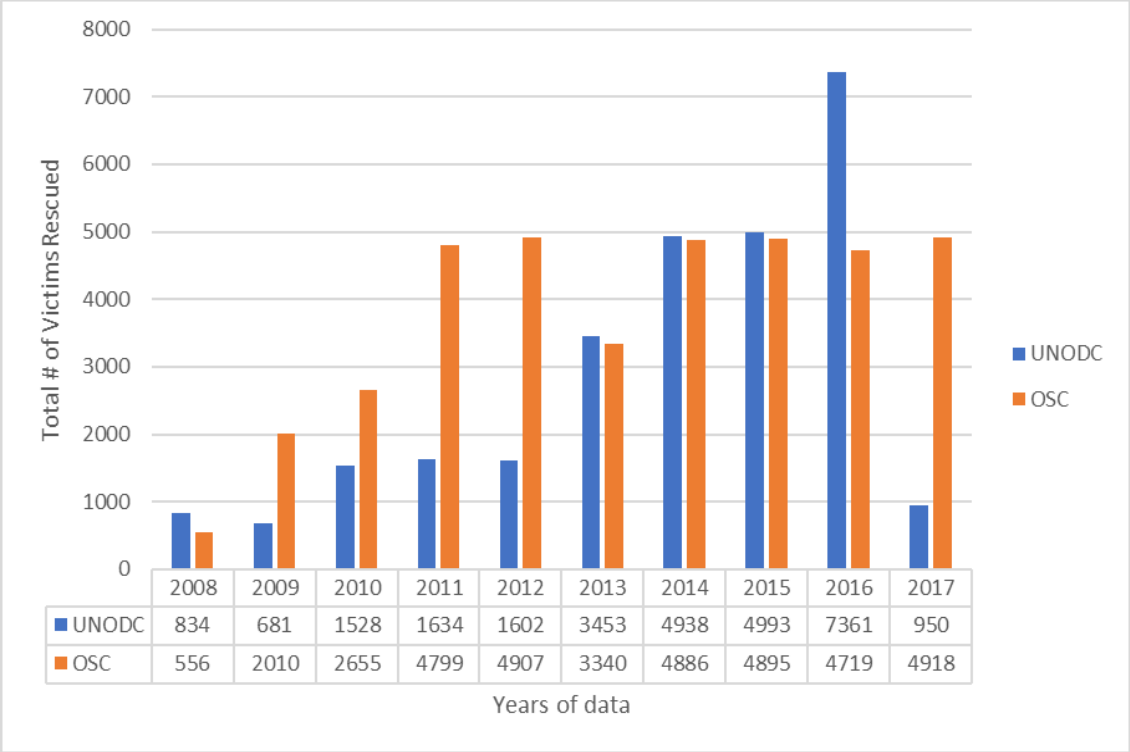
DESTINATION COUNTRIES	
Compilation	**UNODC**
Foreign Countries	United States
Colombia	Argentina
Venezuela	Chile
Brazil	Mexico
Dominican Republic	Panama
Nicaragua	Dominican Republic
Honduras	El Salvador
United States	Guatemala
Mexico	Canada
India	Peru

Realistic Estimates

The conditions that facilitate IHT and the systemic factors that influence efforts to improve data quality are likely to vary over time. Therefore, if a data source generates realistic estimates, we should observe some variance in the overall structure of the networks. The next set of analyses aims to investigate this issue by examining the victim count across the 10-year period from 2008 to 2017. Then, this analysis will compare the similarity of networks between successive years and utilize a regression model to control for potential covariates of positional centrality. Finally, the realism of estimates is illustrated with case studies.

Detected Victimizations

Material differences are observed when comparing the two panels of Figure 11. It is important to note the difference in scale on the Y-axis. While both data sources reported a comparable number of victims in 2008, the original source compilation identifies at least five times more victims compared to the UNODC data. Furthermore, over time, the victim counts in the original source compilation remained stable, while the UNODC figures continued to increase.



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
UNODC	834	681	1528	1634	1602	3453	4938	4993	7361	950
OSC	556	2010	2655	4799	4907	3340	4886	4895	4719	4918

Figure 11 Comparison of Victims Identified, 2008-2017

Network Similarity

Network similarity also shows variability depending on the data source. In this study, two sets of 10 networks were examined: one generated from the original source compilation data and the other generated from the UNODC data. The networks represent connections between countries based on reported instances of human trafficking between them.

To measure the stability of the observed networks over time, network similarity was assessed using a two-year moving window. The Jaccard Similarity Index, ranging from 0 to 1, was used to calculate the similarity between two sets of data. A score closer to 1 indicates a higher similarity between the sets. In this context, a score of 1 would mean that the same trafficking relations between countries were observed in both years.

Table 9 shows that network stability is generally higher for the UNODC-generated networks compared to the original source compilation networks. Furthermore, the stability of the UNODC networks tends to increase over time. In contrast, the original source compilation networks exhibit substantial evolution and lower stability.

Table 9 Comparison of Jaccard Coefficients (2008-2017)

OBSERVATION	***ORIGINAL COMPILATION***	***UNODC***
2008-2009	0.18	0.56
2009-2010	0.20	0.49
2010-2011	0.37	0.49
2011-2012	0.25	0.53
2012-2013	0.17	0.63
2013-2014	0.55	0.53
2014-2015	0.15	0.63
2015-2016	0.26	0.61
2016-2017	0.15	0.74

Regression Model

As part of this study's analysis, a QAP regression model was utilized to examine the factors that might influence data collection over time. The model aimed to control for border connectivity (represented by the length of the border with other countries and the number of people affected by conflicts in the countries) and participation in armed conflicts. These variables were applied to the centrality metrics (out-degree and in-degree centrality scores) of each country, considering both the original source compilation data and the UNODC data (see TABLE 10).

For the original source compilation data, the regression results showed that for out-degree centrality, the length of the border (measured in kilometers) had an R2 of 0.0566, with an F-value of 4.721 ($p = 0.034$). The variable Conflict had an R2 of 0.0155, with an F-value of 2.006 ($p = 0.139$). Regarding in-degree centrality, the border length had an R2 of 0.0166, with an F-value of 2.048 ($p = 0.140$), while Conflict had an R2 of -0.0126, with an F-value of 0.201 ($p = 0.650$).

For the UNODC data, the regression results showed that for out-degree centrality, the border length had an R2 of -0.0052, with an F-value of 0.234 ($p = 0.599$), and the variable Conflict had an R2 of -0.0092, with an F-value of 0.053 ($p = 0.754$). Regarding in-degree centrality, the border length had an R2 of -0.0052, with an F-value of 0.468 ($p = 0.461$), while Conflict had an R2 of -0.0097, with an F-value of 0.001 ($p = 0.978$).

These regression results indicate that the variables of border length and conflict have limited explanatory power in relation to the centrality metrics for both data sources. The coefficients and p-values suggest that these variables do not significantly influence the out-degree and in-degree centrality scores in either data source.

The original compilation has positive coefficients for border length, which means that the longer the borders the higher the out degree will be for those countries. On the other hand, the UNODC data has negative coefficients on border length, which means that the longer the border is the lower the out degree will be for those countries. Looking at conflict in both datasets, it was found that there was no significance in either data set when analyzing the number of people moving due to the conflicts and number of human trafficking victims registered by the country.

Table 10 Original Compilation and UNODC Regression Analysis

	Regression Analysis			
Original Compilation Sources	**R-square**	**R2**	**F Value**	**Probability**
Out-degree Centrality Model				
Border length by KM	0.0718	0.0566	4.721	0.034
Conflict	0.0309	0.0155	2.006	0.139
In-Degree Centrality Model				
Border length by KM	0.0325	0.0166	2.048	0.140
Conflict	0.0032	-0.0126	0.201	0.650
UNODC				
Out-degree Centrality Model				
Out-degree and border length by KM	0.0023	-0.0076	0.234	0.599
Out-degree and Conflict	0.0005	-0.0092	0.053	0.754
In-Degree Centrality Model				
In-degree and border length by KM	0.0046	-0.0052	0.468	0.461
In-degree and Conflict	0	-0.0097	0.001	0.978

Case Studies

Compared to UNODC data, the original source compilation should provide more realistic estimates of the movement of people to gain a better perspective on the interaction between countries and the connections that exist between two countries. These countries were selected based on their ranking of centrality over time and frequency. In this ego network analysis, out-degree and in-degree centrality were used to examine the impact and differences in the network within the same country. The first country analyzed was Argentina, which consistently ranked among the top 10 countries in terms of centrality in the social network in both data sets. The second country was Venezuela, which, despite having limited

data, was still reported by other countries as rescuing victims of human trafficking, thus remaining active in the social network in both data sets.

Argentina was selected to be part of the ego study because it consistently ranked among the top ten countries in the overall data positions. In Figure 12a, the focus is on the out-degree centrality in Argentina using the original compilation data. In this network, it is possible to see that Argentina is not a central player within the network, and countries such as the Dominican Republic, Colombia, and Venezuela are more central. However, Argentina has active connections with these more central actors. The same analysis was performed on the ego network of Argentina, but this time using the UNODC data (Figure 12b). The results show a strong connection between the United States and Mexico, positioning them as central countries. However, Argentina, Peru, Chile, and El Salvador are countries that are centrally located in the network. Argentina also exhibits strong relation ties with other countries such as Bolivia and Paraguay.

Next, looking at in-degree centrality in Argentina with original compilation, it is possible to see that Argentina is the central player within the network, along with Peru, Paraguay, and Uruguay (Figure 13a). Argentina also exhibits strong ties with other central countries within the network.

The same analysis was conducted on the ego network of Argentina using the UNODC data (Figure 13b). In this analysis, the results show that Argentina is not a central country in the network. However, Argentina still maintains connections with all the countries in this network. The most central countries in this network are Colombia, China, the Dominican Republic, Venezuela, and Peru. There is also a strong connection between the United States and El Salvador.

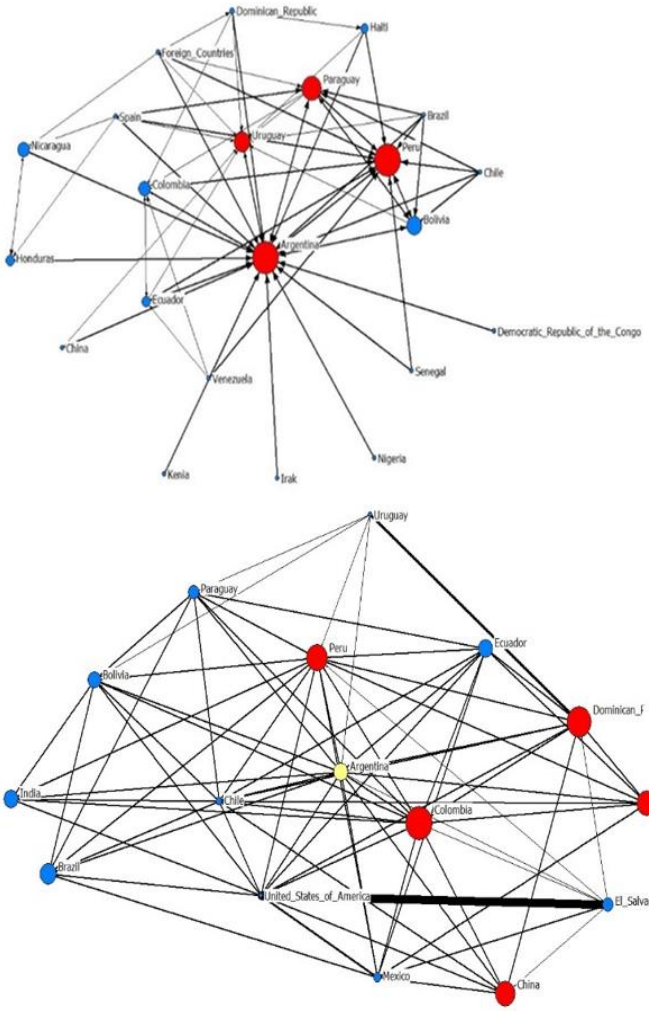
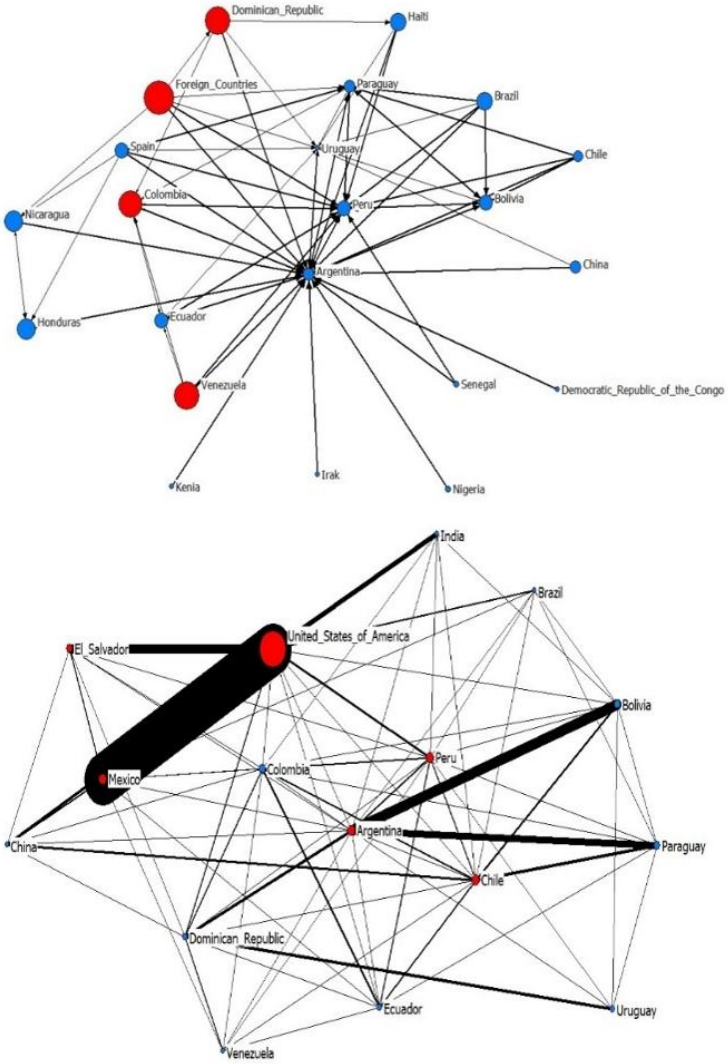


Figure 12 Out-Degree Argentina Ego Compilation vs. UNODC



a) Original Compilation

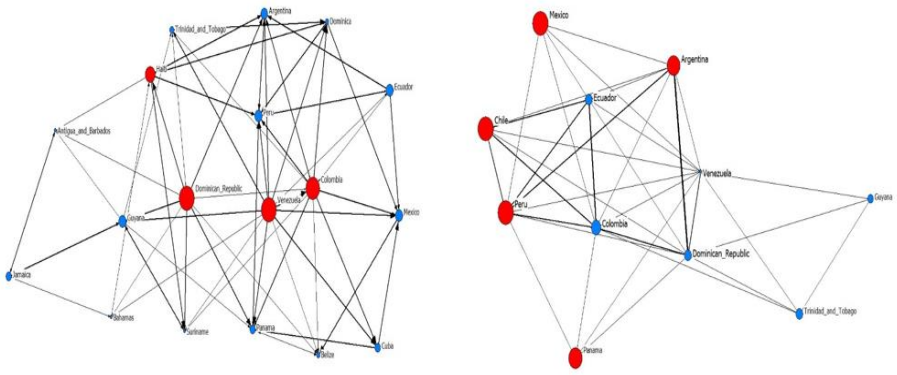
b) UNODC

Figure 13 In-Degree Argentina Ego Network Compilation vs. UNODC

Venezuela is one of the countries that had very little information about victims of human trafficking during data collection and didn't report anything to the UNODC, most likely due to the ongoing civil conflicts between the government and the citizens. However, this lack of reporting didn't prevent other

countries from reporting rescues of victims from Venezuela, thus making Venezuela an active country in the social networks. Similar to the analysis conducted for Argentina, an analysis of out-degree and in-degree centrality was performed for Venezuela.

Observing Figure 14a, it is clear that in the original compilation data, Venezuela is one of the central actors within the network, alongside Colombia, the Dominican Republic, and Haiti. Venezuela also has multiple connections with most of the countries that are active in the network.



a) Original Compilation

b) UNODC

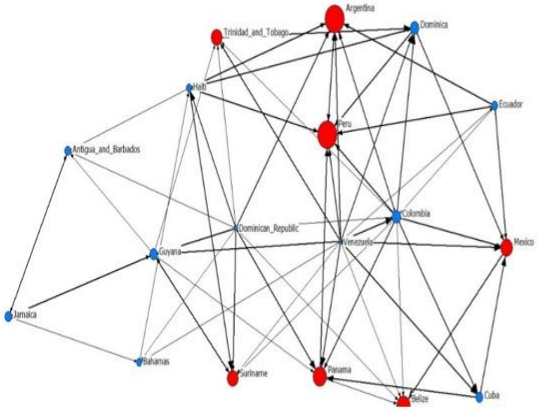
Figure 14 Out-Degree Venezuela Ego Compilation vs UNODC

Analyzing the UNODC data using an out-degree analysis, Venezuela is not among the central countries. Instead, countries such as Argentina, Mexico, Chile, Peru, and Panama exhibit the same centrality in the network (Figure 14b).

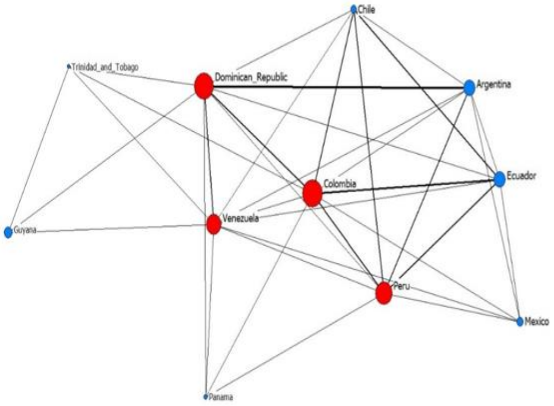
This network has multiple connections but is less dense compared to the multiple connections observed in the original compilation data. Additionally, there is a strong tie between Colombia and Ecuador, as well as a second strong tie between the Dominican Republic and Argentina.

Now, focusing on the In-degree centrality in Venezuela using the original compilation data, it becomes apparent that Venezuela is not a central player within the network. The most central countries in this network are Argentina, Peru, Mexico, Belize, Panama, Suriname, and Trinidad and Tobago. Although Venezuela is not central, it still maintains strong ties with Peru and Panama (Figure 15a).

Turning to an investigation of the changes in the network using the UNODC data, this study observes that Venezuela is considered one of the central countries, although the Dominican Republic and Colombia have higher centrality. Peru shares the same centrality as Venezuela (Figure 15b). This network exhibits fewer connections compared to the multiple connections observed in the original compilation data. It also reveals a strong tie between Colombia and Ecuador, as well as a second strong tie between the Dominican Republic and Argentina.



a) Original Compilation



b) UNODC

Figure 15 In-Degree Venezuela Ego Compilation vs. UNODC

In summary, this case study found that the original source compilation data provides more realistic estimates and a better perspective on the movement of people involved in human trafficking, offering improved insights into the interactions between countries. It revealed variations in network structure and centrality rankings between the original compilation data and UNODC data,

highlighting the significance of data sources in understanding the connections and positions of countries within human trafficking networks in the Americas. The selection of two countries for this study was based on their importance within the overall network, with Argentina consistently active and centralized, and Venezuela exhibiting less activity and varying levels of centralization. The analysis demonstrated diverse patterns of network centrality depending on the dataset used. Overall, the original compilation data enhanced our comprehensive understanding of human trafficking networks in the Americas, underscoring the importance of data sources in assessing the structure and positional significance of countries.

CHAPTER FIVE :

DISCUSSION AND CONCLUSION

Social Network Analysis (SNA) provides a valuable framework for studying illicit interactions and understanding the complex dynamics of illicit behavior. It allows for theorizing, describing, and modeling these behaviors in a way that traditional approaches may not capture. Social networks consist of social actors, such as individuals or organizations, and the connections and interactions between them. SNA tools can identify and analyze relationships at various levels of social connectivity, ranging from individuals to groups, organizations, and even nations.

In the context of this study, the use of social networks has yielded insights into the quality of data on human trafficking and its impact on the observed network structure. The first research question, comparing the original source compilation to UNODC data, confirms that the original source compilation generates more complete networks. This is attributed to the inclusion of information regarding the victim's nationality and their connection to their original country. Additionally, the original source compilation generates larger and more complex networks that include multiple countries outside the Americas, with greater reciprocity and consistency over time. In contrast, UNODC data relies on information reported to the UN, which restricts the number of countries involved and the nature of the connections to focus on reporting nations.

Regarding the second research question, which focuses on the realism of estimates, the Jaccard study conducted in this research provides valuable insights. The stability and changes observed in the data over time indicate that UNODC data remains relatively consistent, while the original source compilation exhibits significant fluctuations. This suggests that the original source compilation provides more realistic estimates of the movement of people reflecting the dynamic context of factors that facilitate IHT. While both datasets are stable for analysis purposes, the number of people rescued from human trafficking is influenced by external factors beyond the organization's control. UNODC data, being more filtered and qualified as human trafficking, presents a specific perspective on the issue, whereas the original source compilation offers a clearer and less filtered view.

Finally, the research question regarding stability in positional metrics (centrality) in relation to border connectivity and involvement in armed conflict can be addressed through the regression model. The results indicate that the original source compilation is more influenced by border connectivity in terms of out-degree centrality, while the UNODC data shows no impact. However, neither dataset shows a significant association with armed conflict. This may be due to the specific countries included in the study and the availability of conflict-related data. Nevertheless, the results suggest that the central positioning in INT networks generated from original source compilation draws attention to geographically central nations and does not vary by political instability.

Overall, the utilization of SNA in this study has shed light on the quality of data, the realism of estimates, and the stability of positional metrics in the context of human trafficking. The original source compilation of data demonstrates its advantages in generating more complete networks, providing more realistic estimates that highlight geographically central nations.

Implications

Previously, researchers using social network analytics to study criminal behavior argued that data limitations must be contextualized to better understand the implications of findings (e.g., Bright, Brewer, & Morselli, 2021). Since source data and network generation protocols can significantly affect observations, some authors have also begun to advocate usage rules in an effort to stem the misuse and misinterpretation of analytics (Bichler & Jimenez, 2023; Campana & Varese, 2012). The current study contributes to this discussion by comparing two data sources--one source involved significant effort by the researcher (original source compilation) and the other involved downloading an “official” data set. The results show that original source compilation produced higher quality data based on three dimensions—network completeness, variability in positional metrics, and realism of movement estimates.

The completeness of the network is a significant consideration when selecting data sources. By 2017, the UNODC still significantly underestimated IHT victimization in the Americas, pointing to limitations in the use of social network analysis in studying crime, especially international crimes and the

interactions between nations facilitating illicit transfers or smuggling of people. Despite resources invested in combating human trafficking, the available official data on rescues and the number of victims is only a small fraction of the actual prevalence. In contrast, collecting and compiling original source data results in larger more complicated networks.

Efforts to combat IHT would benefit from original source compilation in two related ways (1) resources may be more accurately deployed to key movement corridors in each region, (2) resulting in a more equitable distribution of interdiction and victim outreach effort. The findings of this study also indicate that high quality data are more apt to generate more realistic estimates of network characteristics. Observed networks should evolve reflecting changing movement patterns and as socio-political conditions shift there should be a corresponding shift in the positional importance of specific countries. It is important to have accurate information about the roles played by each country. When data sources continually spotlight a couple of nations despite radical change in factors that facilitate IHT, those dominant nations will come to have undue influence on international policy. This may result in the facilitation of resource deserts. For example, the Trafficking Victims Protection Act of 2000 of the U.S.A. not only tracks information regarding HT in the U.S.A but several other countries having a global and regional international legal instruments and supplement to the United Nations Convention against Transnational Organized Crime (UNTOC). However, Van Dijk and van Mierlo (2014) argue that drawing attention to the deficits in

source data by doing comparative analysis will help to improve data collection and compilation by exposing how national policies affect the quantity and quality of human trafficking data collected.

Potential Limitations

One of the potential limitations associated with collecting the original source data set was introduced by the difficulty encountered when attempting to locate relevant information. The goal was to include human trafficking data from official government websites. However, it was found that human trafficking data is not consistently captured and reported. Information had to be gathered from various sources such as police departments, health departments, or victimization reports. Some of the information was collected from the police department, health department, or a victimization report of a crime unit. In the world of social network, the network criminology advances the idea that criminal behavior is the product of interaction between actors/individuals and then by mapping out these interactions among pairs or entities it is possible to uncover and prioritize points of intervention. It is assumed that by enactive policy or deploying counter measures that serve to prevent critical interaction from happening as possible to disrupt criminal activity.

During the research, a limitation was identified regarding the study's focus on one specific region, the Americas, as well as the dominance of data assembled by the United States. Although countries have information on how they address human trafficking and the policies in place, some countries lack

available data as they report their information to the United States, particularly countries in the Caribbean. Out of the 35 total countries, 17 relied on U.S. reports, comprising around 48% of the dataset.

This narrow focus means that the study only represents a small portion of the global human trafficking network and the connections between countries. It is acknowledged that this limited scope provides only a partial understanding. However, even with this limitation, original source compilation revealed a growing and complex pattern of IHT. During the study period there was an increase in the number of countries actively participating in data collection and reporting on human trafficking and victims' rescues. Specifically, comparing the countries active in 2008 to 2019 reveals a significant increase. This can be attributed to the implementation of various policies and laws since 2008, when the United Nations became more involved in combating and prosecuting human trafficking as an international crime. Additionally, resources for victims of human trafficking were established during this time.

Variability in how countries identify and define IHT may also pose a limitation. For example, much of the information found in the Americas was in other languages, predominantly Spanish. This introduced variations in Spanish terminology, which could impact translation and interpretation of the data due to different contextual uses of words. Also, some source documents did not specify if victims were rescued were their final destinations or if they still had further to travel.

Most of the time, the data from countries only indicates the origin of the rescued victims. While a potential limitation, these issues underscore the methodological strength associated with combining different data sources to complement the information available on human trafficking. Since IHT involves movement between an origin and a destination, there are two opportunities to identify victimization. This partially mitigates the effect that any single nation's data collection protocols have on the observed network (Bright, Malm, & Koskinen, 2018).

Moving forward, these limitations emphasize the need for improved data collection methods, increased collaboration between countries, and the establishment of standardized methodologies to effectively study and combat human trafficking.

Future Research

Future research will benefit from using R-Siena, a software that can analyze the centrality importance of actors over time in a social network setting. This analysis is crucial as a country's centrality can change over time, influenced by various factors such as conflicts that may impact the movement of people and the likelihood of victims being trafficked to that country. It will also help understand how centrality in the network affects connectivity with other countries, as a country that remains central over time is likely to have significant connections or relationships with other countries in the social network.

Drawing from previous research on similar projects and their results, it is easier to identify high-quality data and sources that will help understand the complexity of human trafficking. Jorgensen, Forney, Hall, and Giles (2018) demonstrated in their study how to address missing round-robin data using Bayesian data, which strengthens the data compared to relying on a single data set. The study also incorporated partially observed covariates as auxiliary correlates or substantive predictors. Drawing from past studies on missing data, it is crucial to have the most complete data possible to avoid errors and misinterpretation of results. Therefore, combining multiple data sources and including variables that support missing data is necessary for obtaining more accurate results in social network analysis.

Lastly, future research will also focus on tracking the networks of countries outside of the Americas. As shown in this study, understanding the human trafficking networks in the Americas and how they interact with global countries in Africa and Europe is important. This will contribute to expanding the social networks and gaining a more comprehensive understanding of how international human trafficking operates. With this information, it will be possible to deepen the understanding and further expand research on human trafficking.

REFERENCES

Arteaga, L. M. T. El Negosio Rentable del Siglo XXI: La Trata de Personas, el Caso de los Esclavos Colombianos Rescatados en Argentina en 2013. *BELVEDERE*.

Barner, Okech, D., & Camp, M. (2014). Socio-Economic Inequality, Human Trafficking, and the Global Slave Trade. Societies (Basel, Switzerland), 4(2), 148–160. https://doi.org/10.3390/soc4020148

Bettio Francesca and Tushar K Nandi. 2009. Evidence on Women Trafficked for Sexual Exploitation: A rights-based analysis. European Journal of Law and Economics, 29: 15-42

Bichler, G., & Jimenez, I. (2023). Drug Smuggling Seizures: The effects of reporting consistency and quality on the observed transnational Structure. Journal of Drug Issues, 53(1), 159–179.

Bichler, & Malm, A. (2013). Small Arms, Big Guns: A dynamic model of illicit market opportunity. Global Crime, 14(2-3), 261–286. https://doi.org/10.1080/17440572.2013.787928

Bright, D., Malm, A., & Koskinen, J. (2018). Illicit network dynamics: The formation and evolution of a drug trafficking network. Journal of Quantitative Criminology, 1-22. https://doi.org/10.1007/s10940-018-9379-8

Caribbean Migration Consultations. (2019). Caribbean Regional Thematic Meeting on Trafficking in Human Beings and Smuggling of Migrants. Caribbean Migration. Retrieved 2022, from

https://caribbeanmigration.org/events/caribbean-regional-thematic-meeting-trafficking-human-beings-and-smuggling-migrants

Daniele, V., & Marani, U. (2011). Organized Crime, the Quality of Local Institutions and FDI in Italy: A panel data analysis. *European Journal of Political Economy*, *27*(1), 132-142.

Dammert-Guardia, Dammert, L., & Sarmiento, K. (2020). La Trata de Personas en los Andes: Dinámicas socio-espaciales en las fronteras de Perú. Iconos : Publicación de FLACSO-Ecuador, 24(68), 117–134. https://doi.org/10.17141/iconos.68.2020.4043

Data and Research on Human Trafficking: A global survey. (2006). *Choice Reviews Online*, *43*(11), 43–660243–6602. https://doi.org/10.5860/choice.43-6602

Davy, D. (2016). Anti–Human Trafficking Interventions: How do we know if they are working? *The American Journal of Evaluation*, *37*(4), 486–504. https://doi.org/10.1177/1098214016630615

Dirienzo, C., & Das, J. (2017). Human Trafficking and Country Borders. International Criminal Justice Review, 27(4), 278-288.

Ellwardt, Steglich, C., & Wittek, R. (2012). The Co-Evolution of Gossip and Friendship in Workplace Social Networks. Social Networks, 34(4), 623–633. https://doi.org/10.1016/j.socnet.2012.07.002

Finckenauer, J. O., & Schrock, J. (2000). Human trafficking: A growing criminal market in the US. human trafficking: Data and documents, 14.

Fouladvand. (2018). Decentering the Prosecution-Oriented Approach: Tackling Both Supply and Demand in the Struggle Against Human Trafficking. *International Journal of Law, Crime and Justice*, *52*, 129–143. https://doi.org/10.1016/j.ijlcj.2017.11.001

Global Internal Displacement Database. IDMC. (n.d.). Retrieved March 26, 2023, from https://www.internal-displacement.org/database/displacement-data

Greenbaum, J., Bodrick, N., Flaherty, E. G., Idzerda, S. M., Laskey, A., Legano, L. A., ... & Committee on Child Abuse and Neglect. (2017). Global Human Trafficking and Child Victimization. Pediatrics, 140(6).

Hachey, L. M., & Phillippi, J. C. (2017). Identification and Management of Human Trafficking Victims in the Emergency Department. *Advanced emergency nursing journal*, *39*(1), 31-51.

Hawdon, James E. (1999). Daily Routines and Crime. Youth & Society, 30(4), 395–415. https://doi.org/10.1177/0044118X99030004001

Hunter, D. R. (2007). Curved Exponential Family Models for Social Networks. Social Networks, 29:216–230.

Holt, T. J., Burruss, G. W., & Bossler, A. M. (2018). Assessing the Macro-Level Correlates of Malware Infections Using a Routine Activities framework. *International journal of offender therapy and comparative criminology*, *62*(6), 1720-1741.

Horne, C., & Barney, M. (2019). The Impact of UN Peacekeeping Operations on Human Trafficking. *International Migration*, *57*(5), 3–20. https://doi.org/10.1111/imig.12606

Issa, D. (2017). Modern Slavery and Human Trafficking in Latin America. *Latin American Perspectives*, *44*(6), 4-15.

ILO says forced labour generates annual profits of US$ 150 billion. (2014, May 20). International Labour Organization. https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_243201/lang--en/index.htm

Jac-Kucharski, A. (2012). The Determinants of Human Trafficking: A US case study. International Migration, 50(6), 150-165

James P. Lynch. (1987). Routine Activity and Victimization at Work. *Journal of Quantitative Criminology*, *3*(4), 283–300. https://doi.org/10.1007/BF01066832

Jorgensen, T. D., Forney, K. J., Hall, J. A., & Giles, S. M. (2018). Using Modern Methods for Missing Data Analysis with the Social Relations Model: A bridge to social network analysis. Social Networks, 54, 26–40. https://doi.org/10.1016/j.socnet.2017.11.002

Kempadoo, K. (2007). The War on Human Trafficking in the Caribbean. Race & Class, 49(2), 79-85.

Kotrla, K. (2010). Domestic Minor Sex Trafficking in the United States. *Social work*, *55*(2), 181-187.

Kossinets, G. (2006). Effects of Missing Data in Social Networks. Social Networks, 28(3), 247–268. https://doi.org/10.1016/j.socnet.2005.07.002

Kreidenweis, A., & Hudson, N. F. (2015). More than a Crime: Human trafficking as human (In)Security. International Studies Perspectives, 16(1), 67–85.

Laczko, F. (2005). Data and Research on Human Trafficking. International Migration, 43(1-2), 5-16.

Latonero, M. (2012). The Rise of Mobile and The Diffusion of Technology-Facilitated Trafficking. Research Series on Technology and Human Trafficking Center on Communication Leadership & Policy, Los Angeles, CA: University of South California

Lawrence E. Cohen, & Marcus Felson. (1979). Social Change and Crime Rate Trends: A routine activity approach. *American Sociological Review*, *44*(4), 588–608. https://doi.org/10.2307/2094589

Lusher, D., Koskinen, J., & Robins, G. (Eds.). (2013). Exponential Random Graph Models for Social Networks: Theory, methods, and applications (Vol. 35). Cambridge University Press.

Marcus Felson, & Lawrence E. Cohen. (1980). Human Ecology and Crime: A routine activity approach. *Human Ecology : an Interdisciplinary Journal*, *8*(4), 389–406. https://doi.org/10.1007/BF01561001

Margit Averdijk. (2011). Reciprocal Effects of Victimization and Routine Activities. *Journal of Quantitative Criminology*, *27*(2), 125–149. https://doi.org/10.1007/s10940-010-9106-6

Miller, Joel. (2013). Individual Offending, Routine Activities, and Activity Settings: Revisiting the routine activity theory of general deviance. The Journal of Research in Crime and Delinquency, 50(3), 390–416. https://doi.org/10.1177/0022427811432641

Miró, F. (2014). Routine Activity Theory. *The encyclopedia of theoretical criminology*, 1-7.

Mustaine, Elizabeth Ehrhardt, & Tewksbury, Richard. (1999). A Routine Activity Theory Explanation for Women's Stalking Victimizations. *Violence Against Women*, *5*(1), 43–62. https://doi.org/10.1177/10778019922181149

Pearce, J. (2010). Perverse State Formation and Securitized Democracy in Latin America. Democratization, 17(2), 286-306.

Polaris. (2022) Recognizing Sex Trafficking. Retrieved 2022, from https://polarisproject.org/sex-trafficking/

Polaris Project. (2019). U.S. National Human Trafficking Hotline Statistics. Polaris. Retrieved 2022, from https://polarisproject.org/resources/us-national-human-trafficking-hotline-statistics/

R. (2014, December 13). Social Network Analysis. Friendsarena. Retrieved 2022, from https://friendsarena.wordpress.com/2014/12/11/18/

Ramos-Con, & Rodríguez-Fernández, A. (2018). Entre lo Oculto y lo Silenciado:La trata de personas en Costa Rica y sus desafíos para la investigación académica. Revista Espiga (San Jose.), 17(35), 18–30. https://doi.org/10.22458/re.v17i35.1803

Rao, S., & Presenti, C. (2012). Understanding Human Trafficking Origin: A cross-country empirical analysis. *Feminist economics*, *18*(2), 231-263.

Ravinderkhatri. (2014, December 13). Social Network Analysis. friendsarena. https://friendsarena.wordpress.com/2014/12/11/18/

Reid, J. A. (2012). Exploratory Review of Route-specific, Gendered, and Age-graded Dynamics of Exploitation: Applying life course theory to victimization in sex trafficking in North America. Aggression and Violent Behavior, 17(3), 257-271.

Rengifo, Andres F, & Bolton, Amanda. (2012). Routine Activities and Fear of Crime: Specifying individual-level mechanisms. European Journal of Criminology, 9(2), 99–119. https://doi.org/10.1177/1477370811421648

Ripley R, Snijders TAB, Boda Z, Voros A, Preciado P. Manual for RSiena. 2016 Available at: http://www.stats.ox.ac.uk/~snijders/siena/RSiena_Manual.pdf.

Ripoll De Castro. (2008). Colombia: Semillero para la trata de personas. Revista de Relaciones Internacionales, Estrategia y Seguridad, 3(1), 174–175. https://doi.org/10.18359/ries.180

Ruggiero, V. (1997). Criminals and Service Providers: Cross-national dirty economies. Crime, Law and Social Change, 28(1), 27-38.

Sacco Studnicka, A. C. (2010). Corruption and Human Trafficking in Brazil: Findings from a multi-modal approach. *European Journal of Criminology*, *7*(1), 29-43.

Saloni Dattani, Hannah Ritchie and Max Roser (2021) - "Mental Health". Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/mental-health' [Online Resource]

Sampson, Eck, J. E., & Dunham, J. (2010). Super Controllers and Crime Prevention: A routine activity explanation of crime prevention success and failure. Security Journal, 23(1), 37–51. https://doi.org/10.1057/sj.2009.17

Shelley, L. (2012). The Relationship of Drug and Human Trafficking: A global perspective. European journal on criminal policy and research, 18(3), 241-253.

Sykiotou, A. P. (2007). Trafficking in Human Beings: Internet recruitment. Council of Europe: Directorate general of human rights and legal affairs

Ulasoglu Imamoglu, S. (2021). Anti-Trafficking Efforts and Civil Conflicts. *Journal of Human Trafficking*, *ahead-of-print*(ahead-of-print), 1–22. https://doi.org/10.1080/23322705.2021.1940777

United Nation Office on Drug and Crime. (2022). United Nation Office on Drug and Crime. https://www.unodc.org/unodc/en/human-Trafficking/Human-Trafficking.html

U.S. Department of State. (2013,). Trafficking in Persons Report 2013. U.S. Department of State Diplomacy in Action. Retrieved 2022, from https://2009-2017.state.gov/j/tip/rls/tiprpt/2013/index.htm

van Dijk, J. J. ., & van Mierlo, F. (2014). Quantitative Indices for Anti-Human Trafficking Policies: Based on reports of the U.S. State Department and the Council of Europe. Crime, Law, and Social Change, 61(2), 229–250. https://doi.org/10.1007/s10611-013-9510-6

Väyrynen, R. (2005). Illegal Immigration, Human Trafficking and Organized Crime. In Poverty, International Migration and Asylum (pp. 143-170). Palgrave Macmillan, London.

Venezuela. Venezuela | Country Page | World | Human Rights Watch. (2022, March 28). https://www.hrw.org/americas/venezuela?gclid=CjwKCAjwtuOlBhBREiwA7agf1rsgLfLzrZtE5RnQb2k7JMa5a418xCiRGYA8wDSOa_IE-2hMGJmk2RoCJu4QAvD_BwE%2B

Wasserman, S., & Faust, K. (1994). Social Network Analysis: Methods and applications.

Wheaton, E., Schauer, E., & Galli, T. (2010). Economics of Human Trafficking. International Migration, 48(4), 114-141.

Yakushko, O. (2009). Human Trafficking: A review for mental health professionals. International Journal for the Advancement of Counselling, 31(3), 158-167.

Zhang, S. X. (2012). Measuring Labor Trafficking: A Research Note. *Crime, Law and Social Change*, *58*(4), 469-482.