



ISSN (E) 3007-3197

ISSN (P) 3007-3189

Publisher Name : COLLABORATIVE EDUCATIONAL LEARNING INSTITUTE

Frequency Of Journal: Bi-Annual

Annual Methodological Archive Research Review

VOL-3, ISSUE-1, 2025

Annual Methodological Archive Research Review

<http://amresearchreview.com/index.php/Journal/about>

Muhammad Saeed Hashmi¹

Khalid Mehmood²

Dr. Munaza Gohar³

Muhammad Farhan Asif⁴

The Impact Of Socio-Economic Factors On The Prevalence Of Hepatitis C: A Case Study Of a Public Sector Hospital In Lahore, Pakistan

Muhammad Saeed Hashmi

Ex-Director of Agriculture
(Economics & Marketing) Punjab,
Lahore, Pakistan

Khalid Mehmood

National College of Business
Administration and Economics,
Lahore, Pakistan.

khalid.baryar@gmail.com

Dr. Munaza Gohar

Quaid e Azam Medical College,
Bahawalpur, Punjab, Pakistan

Muhammad Farhan Asif

National College of Business
Administration & Economics,
Lahore, Pakistan

Abstract

Hepatitis C is one of the major and global health problems affecting millions of people every year, particularly in developing countries. Around 11 million people are infected with Hepatitis C, leading to high mortality in Pakistan. Limited information is available regarding the impact of socio-economic factors on the prevalence of Hepatitis C virus (HCV). The objective of our study is to investigate the socio-economic characteristics of HCV patients and analyze the impact of socioeconomic factors on the spread and prevalence of hepatitis C by utilizing clinical data of 350 respondents. To analyze the impact of socio-economic factors on the prevalence of hepatitis C by utilizing clinical data of 350 respondents. For this purpose, we have used Binary Logistics regression because our dependent variable is categorical with two possible outcomes i.e prevalence of HCV is positive and prevalence of HCV is negative. The results show that older respondents aged 30-50 years are more likely to have HCV than younger respondents. The educated people are less likely to have HCV than those who are uneducated. Similarly, those people who belong to rich families are less likely to have HCV as compared to the poor families. The unemployed persons are



VOL-3, ISSUE-1, 2025

more likely to be infected with HCV than those who are currently employed. The likelihood of a family history of HCV indicates that people having a family history of HCV are more likely to be infected with HCV. The people having knowledge about HCV are less likely to have HCV. The history of injectable drug use is also affecting the prevalence of hepatitis C. We conclude that education, income and employment are the major socio-economic variables affecting the prevalence of hepatitis C. The main reasons for the rapid spread of this disease is injectable drug use.

Keywords

Prevalence of hepatitis C, Family history of HCV, History of Injectable drug use, Pakistan

BACKGROUND

Hepatitis C is a potentially life threatening infectious liver disease. It causes serious health problems all around the world like higher mortality and longer morbidity costs to patients. Approximately 71 million people are victims of hepatitis C across the globe (WHO, 2017). It causes one tenth of deaths worldwide every year (WHO, 2012). There are about 700,000 deaths per year in the world due to Hepatitis C (WHO, 2016) and most of these are in low and middle income countries (Lozano et al., 2012; Khan, 2020).

The frequency of hepatitis C varies all over the world. It is considered low in U.K, the Scandinavian Peninsula, Western Europe, U.S, Australia and South Africa. It is intermediary in Eastern Europe, Brazil, and in some regions of Africa and Asia. The highest rates are found in Egypt (17% to 26%) (Wesley and Alter, 2000). After Egypt, Pakistan has the highest prevalence of Hepatitis C (HCV) and its range from 4.5% to 8% (Khattak et al., 2009; WHO, 2012). The highest prevalence of hepatitis C was found in Punjab (7%), while around 5% of people were infected in the entire country and over 400 deaths are caused by Hepatitis each day (WHO, 2017). The main reasons for the rapid spread of this disease are lack of knowledge and poor medical facilities, especially in the least developed countries (Russo, 2022; Rahat & Hayat, 2020; Hameed, 2020; Crutzen and Goritz, 2012; Du et al., 2012; Alam et al., 2007; Khuwaja et al., 2002).

However, poor capacity of developing countries due to their poor infrastructure in health sector makes hepatitis a severe challenge for them. Pakistan is a developing country with low health and educational standards. According to the human development index, Pakistan ranked 150th out 189 countries with respect low health and educational standards (UNDP, 2018).

Socio-economic characteristics defined as “an individual’s position in society based on the criteria such as education, occupation, income and the value of dwelling place”. Many research studies have found the relationship between different socio-economic determinants and prevalence of hepatitis C (Perez et al., 2005; Armstrong et al., 2006; Meffre et al., 2010).

**VOL-3, ISSUE-1, 2025**

Hepatitis C is mainly transmitted through the use of injectable drugs (WHO, 2016; Folch et al., 2016; Vriend et al., 2013; Latimer et al., 2009; Harris et al., 2012). Higher infection rates, weak diagnosis of HCV have been connected with lower socio-economic status (Spooner et al., 2005; Flores et al., 2008; Omland et al., 2013). Frequent use of injectable drugs and high prevalence of hepatitis C is related to lower income, lower education attainment, reduced employment and higher homelessness (Miller et al., 2009; Lea et al., 2013; Picardi et al., 2007; Latimer et al., 2009; Comas et al., 2015; Stopka et al., 2017; Singh, 2020). Conversely, highly paid occupation and higher education level are both connected with more knowledge about HCV (Vermunt et al., 2015) and decreased prevalence of hepatitis C (Latimer et al., 2009). Even after adjusting for other risk factors related to source of infection, these studies found an increased risk of hepatitis C infection in persons with low socio-economic status (Alter et al., 1999; Perez et al., 2005; Armstrong et al., 2006; Meffre et al., 2010; Khan, 2020). Thus, we will analyze the impact of socio-economic factors on the prevalence of hepatitis C. We will focus on age, employment status, income level, educational status, family history of HCV, knowledge about HCV and history of injectable drug use.

METHOD**DATA SOURCE**

The data used in our study is taken from Services Hospital, Lahore, Pakistan, where patients belong to different localities of the province of Punjab. People who visited hepatitis clinic between June 2019 and August 2019 were chosen to be part of the survey and selected randomly through convenient sampling. The questionnaire was designed by the researchers to assess socio-economic and demographic characteristics of patients as well as their knowledge and awareness about HCV. This is a cross-sectional study of 350 respondents (Out of which 190 have positive HCV and 160 have negative HCV). To be eligible to join the study, respondents should be older than 10 years. A person who is younger than 10 years is excluded from the data set based on the idea that younger respondents have minimum interaction with the major risk factors and less likely to be infected with hepatitis C. Of these 350 respondents, 188 are male and 162 are female.

MEASUREMENT

In this study, we have attempted to investigate the impact of socio-economic factors like age, income level, educational status, employment status, family history of HCV, knowledge about HCV and history of injectable drug use on the prevalence of hepatitis C.

The functional form of our model is as given below.

$$\text{HCV} = f(\text{AGE}, \text{EDU}, \text{INCMH}, \text{EMP}, \text{FHOHCV}, \text{KNWHCV}, \text{HOIDU})$$

Where

HCV: Prevalence of Hepatitis C is a dependent variable of our study. The responses for HCV are divided into two categories: HCV is negative (coded as 1) and HCV is positive (coded as 2).

AGE: Respondent's age has been classified into two groups, i.e. up to 30 years and greater than 30 years. If respondent's age is up to 30 years, then coded as 1 and respondent's age greater than 30 years is coded as 2.

EDU: Respondent's educational status has been divided into two groups. If respondent has the minimum primary education, then coded as 0, if the respondent has greater than primary education then coded as 1.

**VOL-3, ISSUE-1, 2025**

INCMH: Income of household has been described into two categories. If a household's income is less than or equal to twenty thousand then coded as 0, if a household has an income greater than twenty thousand then coded as 1.

EMP: Employment status of individuals has been divided into two categories. If respondent is unemployed then coded as 0, if he is labourer, retired and self-employed/ business owner/ public sector worker then coded as 1.

FMOHCV: Family history of HCV is used as an independent variable and divided into two categories. If respondent has no family history of HCV then coded as 0. If respondent has a family history of HCV then coded as 1.

KNWHCV: Awareness /Knowledge about HCV have been divided into two categories. If respondent has no knowledge, then coded as 0, and if the respondent has knowledge about HCV then coded as 1.

HOIDU: History of injectable drug use is divided into two categories. If respondent has no history of injectable drug use then coded as 0. If respondent has a history of injectable drug use then coded as 1.

For our empirical analysis, we have used binary logistic regression. In binary logistic regression, the dependent variable consists of two possible outcomes that are prevalence of HCV coded as 1 and if there is no prevalence of HCV coded as 0. The variable prevalence of HCV has been constructed by using questionnaire based information.

RESULTS

In this study, we have investigated the socio-economic characteristics of the participants of the study and also have analyzed the relationship of the participant's age, participant's education, household's income, respondent's employment status, family history of HCV, knowledge about HCV and history of injectable drug use with a prevalence of HCV. Description of different socio-economic variables is presented in Table 1.

Table 1: Description of different socio-economic variables

| Description of Variables | | Frequency | Percentage |
|--------------------------|-------------------|-----------|------------|
| Age of Respondent | 11-20 | 32 | 9.1 |
| | 21-30 | 81 | 23.1 |
| | 31-40 | 113 | 32.3 |
| | 41-50 | 67 | 19.1 |
| | 51-60 | 43 | 12.3 |
| | 61 and above | 14 | 4.0 |
| Education of Respondent | No education | 131 | 37.4 |
| | Primary education | 34 | 9.7 |
| | Middle | 28 | 8.0 |
| | Matric | 52 | 14.9 |
| | Intermediate | 74 | 21.1 |
| | Higher | 31 | 8.9 |
| Income of Household | Less than 10000 | 66 | 18.9 |
| | 10001-20000 | 102 | 29.1 |
| | 20001-30000 | 50 | 14.3 |
| | 30001-40000 | 60 | 17.1 |
| | 40001-50000 | 42 | 12.0 |
| | 50001 and more | 30 | 8.6 |
| | Unemployed | 181 | 51.7 |

**VOL-3, ISSUE-1, 2025**

| | | | |
|-------------------------------------|--------------------------------------|-----|------|
| Employment Status | Laborer | 50 | 14.3 |
| | Retired | 2 | 0.6 |
| | Public sector worker / Self employed | 117 | 33.4 |
| Family History of HCV? | No | 299 | 85.4 |
| | Yes | 51 | 14.6 |
| Hepatitis C is Preventable? | No | 229 | 65.4 |
| | Yes | 121 | 34.4 |
| History of Injectable Drug Use | No | 189 | 54.0 |
| | Yes | 161 | 46.0 |
| Hepatitis C is Positive or Negative | No | 160 | 45.7 |
| | Yes | 190 | 54.3 |

In table 1, data show that most of the participants are in the age group 31-40 years, which constituted 32.3% of all age groups. Whereas age group 11-20 years contains 9.1% respondents, 23.1% are in 21-30 years, 19.1% are between 41-50 years, 12.1% are between 51-60 years and 4% are in 61 years and above which is the lowest among all age groups. According to educational status, 37.4% respondents have no education, 9.7% got primary, 8% have middle, 14.9% have secondary, 21.1% have intermediate and 8.9% respondents have higher education. Regarding income level, 18.9% respondents have income less than ten thousand, 29.1% has greater than ten thousand and less than or equal to twenty thousand, 14.3% have greater than twenty and less than or equal to thirty thousand, 17.1% have greater than thirty and less than or equal to forty thousand, 12% have greater than forty and less than or equal to fifty thousand and only 8.6% respondents have income greater than fifty thousand which is the lowest among all income brackets. Employment status of respondent shows that 14.3% of them lies in labourer category, 0.6% are retired, 34.4% are self-employed/public sector worker, whereas 51.7% of respondent are unemployed. Regarding the knowledge about HCV respondents were asked “whether hepatitis C is preventable or not?” Only 34.6% of respondent replied yes and 65.4% replied no which reflects the lack of knowledge about HCV. The respondents with a family history of HCV are 14.6%, whereas 85.4% have no family history of HCV. Similarly, only 54% of respondents have a history of injectable and 46% have no history of injectable. According to Prevalence of hepatitis C, only 54.3% respondents have HCV Whereas 45.7% have no HCV infection.

Table 2: Odds ratio (OR) with beta (β) and significance level (sig) for Prevalence of HCV

| Description of Variables | | B | Sig. | OR |
|---------------------------------|-------------------|-----------|------|-------|
| Age of Respondent | Less than 30 | Reference | | |
| | Atleast 30 | .575 | .000 | 1.777 |
| Education of Respondent | Less than Primary | Reference | | |
| | Atleast Primary | -.248 | .068 | .780 |
| Income of Household | Less than 20,000 | Reference | | |
| | Atleast 20000 | -.255 | .058 | .775 |
| Employment Status of Respondent | No | Reference | | |
| | Yes | -.441 | .002 | .643 |
| Family History of HCV | No | Reference | | |



VOL-3, ISSUE-1, 2025

| | | | | |
|--------------------------------|-----|-----------|------|-------|
| Knowledge about HCV | Yes | .732 | .021 | 2.080 |
| | No | Reference | | |
| | Yes | .749 | .096 | 2.114 |
| History of Injectable Drug Use | No | Reference | | |
| | Yes | 2.287 | .000 | 9.843 |
| Constant | | -4.653 | .011 | .010 |

The results of binary logistic regression have been presented in table 2. The results show that younger respondents are less likely to be infected with HCV as compared to older respondents. The likelihood of respondent's education shows that educated people are less likely to have HCV than less educated people. Similarly, the odds ratio indicates that richer people are less likely to have HCV as compared to poor people. The results of binary logistics regression show that there is a negative relationship between respondent's employment status and the prevalence of hepatitis C. The odds ratio shows that labourer class, retired and public sector worker/business owner/self-employed people are less likely to develop Hepatitis C as compared to unemployed people. Furthermore, the analysis of a family history of HCV indicates that people having a family history of HCV are more likely to be infected with HCV. As the coefficient of knowledge about HCV is negative, which implies that knowledge about HCV decreases the probability of being infected with HCV. The result shows that there is positive relationship between history of injectable drug use and the prevalence of hepatitis C. The likelihood of the history of injectable drug use indicates that as the frequency of injection drug use increases the probability of infected with HCV also increases.

DISCUSSIONS

Age of respondents, their educational status, income of the household, employment status of individuals, family history of HCV, awareness about HCV and history of injectable drug use have been identified as major determinants of the prevalence of hepatitis C in Pakistan. The likelihood of HCV is highest among older respondents aged greater than 30 years. The reason behind this is lower interaction of young respondents with risk factors like injectable drug use, dental instruments and blood transfusion. These findings are supported by previous studies in the United States (Armstrong et al., 2006) and Puerto Rico (Perez et al., 2005). Educated people are less likely to have HCV than less educated people. People having higher education are supposed to be more aware about the ways of transmission of HCV (Vermunt et al., 2015). In this way higher education tends to reduce the prevalence of hepatitis C (Latimer et al., 2009). Lower education leads to make people less aware about the ways of transmission of hepatitis C and causes higher prevalence of hepatitis C (Comas et al., 2015; Stopka et al., 2017).

The rich people are less likely to have HCV as compared to the poor people. People having low income are more likely to have a history of injectable drug use because of their limited access to qualified practitioner (Armstrong et al., 2006; Meffre et al., 2010; Omland et al., 2013; Stopka et al., 2017). On the other hand, people higher income can avail better health facilities to improve their health, for example health insurance etc. The higher income allows people to get an HCV test and treatment through convenient and reliable means (Cutler, 2010). The odds ratio shows that labourer class, retired and public sector worker/business owner/self-employed peoples are less likely to develop Hepatitis C as compared to unemployed people. A large proportion of unemployed persons are less likely to access general

**VOL-3, ISSUE-1, 2025**

practitioners to get HCV test and treatment. These findings are parallel to different studies (Miller et al., 2009; Lea et al., 2013; Edmunds et al., 2019).

The likelihood of a family history of HCV indicates that people having a family history of HCV are more likely to be infected with HCV. As the coefficient of knowledge about HCV is negative, which implies that as knowledge about HCV increases the probability of being infected with HCV decreases. Lack of information about the transmission of the disease increases the risk of having Hepatitis C (Yaseen et al., 2014). Awareness and the knowledge about the prevention and transmission of hepatitis C among respondents are crucial factors for promoting the testing and for identification of those being infected. The likelihood of history of injectable drug use indicates that as the frequency of injectable drug use increases the probability of being infected with HCV also increases. The injection drug use is a major risk factor of HCV. The higher frequency of injection drug use is associated with high prevalence of hepatitis C. These findings are supported by various studies (WHO, 2016; Folch et al., 2016; Vriend et al., 2013).

CONCLUSIONS AND RECOMMENDATIONS

The government of Pakistan has been making efforts to reduce the prevalence of hepatitis C in Pakistan. There are several medical and the socio-economic factors affecting the prevalence of HCV. This research, clarifies the social and economic factors affecting the prevalence of HCV by utilizing clinical data with the help of the binary logistic regression. Prevalence of HCV in the younger population is relatively low because of low interaction with risk factors as compared to older respondents. The educated people having higher income are less likely to be infected with hepatitis C. The unemployed persons are more likely to be infected with hepatitis C than employed persons. In this regard, the government should create employment opportunities to reduce the magnitude of unemployment. The prevalence of hepatitis C will reduce because unemployment individuals are positively associated with HCV. The higher prevalence of hepatitis C in underdeveloped countries like Pakistan points towards the lack of economic resources needed to implement prevention policies, thus generating a rising incidence of chronic viral hepatitis. The people having knowledge about HCV are less likely to have hepatitis C. The lack of knowledge and awareness both in the general population and the population at risk and among healthcare providers is impeding the efforts of preventing and controlling hepatitis C spread. This is why educational programs should be promoted in order to ensure better understanding of infections, transmission, prevention and treatment. In this respect, the mass media could play a vital role to decrease the prevalence of hepatitis C by spreading awareness in general public. For this government should provide moral as well as financial support to media. The family history of HCV and history of injectable drug use is also affecting the prevalence of hepatitis C. In this study education, income and employment are the major socioeconomic variables affecting the prevalence of hepatitis C.

The most crucial policy advice we have is that Government should introduce auto disable syringes because reuse of syringes is the major rout cause of hepatitis C. The lack of knowledge and awareness both in the general population and the population at risk and among healthcare providers is impeding the efforts of preventing and controlling hepatitis C spread. This is why educational programs should be promoted in order to ensure better understanding of infections, transmission, prevention and treatment.

**VOL-3, ISSUE-1, 2025**

Government should create employment opportunities to reduce the magnitude of unemployment. In this way the prevalence of hepatitis C will reduce because unemployment is positively associated with HCV. The higher prevalence of hepatitis C in underdeveloped countries like Pakistan points towards the lack of economic resources needed to implement prevention policies, thus generating a rising incidence for chronic viral hepatitis. Management of long term consequences is also impaired by the lack of economic support. Access to medical care should be improved not only physical but also economic, social and cultural access has to be provided.

One of the indicators of sustainable development targets physical access to primary health care services, including preventive, curative and palliative care for communicable diseases like hepatitis C. These are important elements in ensuring health and wellbeing. The theme of hepatitis C on hepatitis day in 2018 was “Finding Missing Million” which implies that more than 80% of infected persons with hepatitis C in the world did not know about their disease. So, government should start hepatitis screening in every hospital even in rural areas so that infected people should be diagnosed and treated. In this way the prevalence of hepatitis C would be reduce in Pakistan. The mass media could play a vital role to decrease the prevalence of hepatitis C by spreading awareness in general public. For this government should provide moral as well as financial support to media.

References

- Alam, M. M., Zaidi, S. Z., Malik, S. A., Naeem, A., Shaukat, S., Sharif, S., ... and Butt, J. A. (2007). Serology based disease status of Pakistani population infected with Hepatitis B virus. *BMC infectious diseases*, 7(1), 64.
- Alter, M. J., Kruszon-Moran, D., Nainan, O. V., McQuillan, G. M., Gao, F., Moyer, L. A., and Margolis, H. S. (1999). The prevalence of hepatitis C virus infection in the United States, 1988 through 1994. *New England journal of medicine*, 341(8), 556-562.
- Armstrong, G. L., Wasley, A., Simard, E. P., McQuillan, G. M., Kuhnert, W. L., and Alter, M. J. (2006). The prevalence of hepatitis C virus infection in the United States, 1999 through 2002. *Annals of internal medicine*, 144(10), 705-714.
- Crutzen, R., and Göritz, A. S. (2012). Public awareness and practical knowledge regarding Hepatitis A, B, and C: a two-country survey. *Journal of infection and public health*, 5(2), 195-198.
- Cutler, D. M., and Lleras-Muney, A. (2010). Understanding differences in health behaviors by education. *Journal of health economics*, 29(1), 1-28.
- Du, J., Wang, Z., Xie, B., and Zhao, M. (2012). Hepatitis C knowledge and alcohol consumption among patients receiving methadone maintenance treatment in Shanghai, China. *The American journal of drug and alcohol abuse*, 38(3), 228-232.
- Edmunds, B. L., Miller, E. R., and Tsourtos, G. (2019). The distribution and socioeconomic burden of Hepatitis C virus in South Australia: A cross-sectional study 2010–2016. *BMC Public Health*, 19(1), 527.
- Flores, Y. N., Yee Jr, H. F., Leng, M., Escarce, J. J., Bastani, R., Salmerón, J. and Morales, L. S. (2008). Risk factors for chronic liver disease in Blacks, Mexican Americans, and Whites in the United States: results from NHANES IV, 1999–2004. *The American journal of gastroenterology*, 103(9), 2231.
- Folch, C., Casabona, J., Espelt, A., Majó, X., Meroño, M., Gonzalez, V., and REDAN Study Group. (2016). High prevalence and incidence of HIV and HCV among

**VOL-3, ISSUE-1, 2025**

new injecting drug users with a large proportion of migrants—is prevention failing?. *Substance use and misuse*, 51(2), 250-260.

- García Comas, L., Ordobás Gavín, M., Sanz Moreno, J. C., Ramos Blázquez, B., Gutiérrez Rodríguez, A., Astray Mochales, J., and Moreno Guillén, S. (2015). Prevalence of hepatitis C antibodies in the population aged 16–80 years in the Community of Madrid 2008–2009. *Journal of medical virology*, 87(10), 1697-1701.
- Hameed, S. (2020). Impact of Violence on Children's Learning Abilities: Evidence from Punjabi Society. *Journal of Policy Options*, 3(2), 61-69.
- Harris, R. J., Ramsay, M., Hope, V. D., Brant, L., Hickman, M., Foster, G. R., and De Angelis, D. (2012). Hepatitis C prevalence in England remains low and varies by ethnicity: an updated evidence synthesis. *The European Journal of Public Health*, 22(2), 187-192.
- Khan, K. K. (2020). Assessing the Impact of Climate Change on Women's Health: A Case Study in Lahore, Punjab, Pakistan. *Journal of Policy Options*, 3(3), 82-89.
- Khan, S. (2020). Understanding Multidimensional Poverty in Khyber Pakhtunkhwa: insights and implications for policy. *Journal of Policy Options*, 3(2), 44-48.
- Khattak, N. U. R., Khan, J., and Ahmad, I. (2009). An analysis of willingness to pay for better solid waste management services in urban areas of district Peshawar.
- Khuwaja, A. K., Qureshi, R., and Fatmi, Z. (2002). Knowledge about hepatitis B and C among patients attending family medicine clinics in Karachi.
- Latimer, W. W., Hedden, S. L., Moleko, A. G., Floyd, L., Lawson, A., Melnikov, A., and Cole, K. (2009). Prevalence and correlates of hepatitis C among injection drug users: The significance of duration of use, incarceration, and race/ethnicity. *Journal of drug issues*, 39(4), 893-904.
- Lea, T., Mao, L., Bath, N., Prestage, G., Zablotska, I., de Wit, J., and Holt, M. (2013). Injecting drug use among gay and bisexual men in Sydney: prevalence and associations with sexual risk practices and HIV and hepatitis C infection. *AIDS and Behavior*, 17(4), 1344-1351.
- Lozano, R., Naghavi, M., Foreman, K., Lim, S., Shibuya, K., Aboyans, V., and AlMazroa, M. A. (2012). Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *The lancet*, 380(9859), 2095-2128.
- Meffre, C., Le Strat, Y., Delarocque-Astagneau, E., Dubois, F., Antona, D., Lemasson, J. M., and Leiser, S. (2010). Prevalence of hepatitis B and hepatitis C virus infections in France in 2004: social factors are important predictors after adjusting for known risk factors. *Journal of medical virology*, 82(4), 546-555.
- Miller, E. R., Hellard, M. E., Bowden, S., Bharadwaj, M., and Aitken, C. K. (2009). Markers and risk factors for HCV, HBV and HIV in a network of injecting drug users in Melbourne, Australia. *Journal of infection*, 58(5), 375-382.
- Omland, L. H., Osler, M., Jepsen, P., Krarup, H., Weis, N., Christensen, P. B., and Obel, N. (2013). Socioeconomic status in HCV infected patients—risk and prognosis. *Clinical epidemiology*, 5, 163-174.
- Pérez, C. M., Suárez, E., Torres, E. A., Román, K., and Colón, V. (2005). Seroprevalence of hepatitis C virus and associated risk behaviours: A population-based study in San Juan, Puerto Rico. *International journal of epidemiology*, 34(3), 593-599.

**VOL-3, ISSUE-1, 2025**

- Picardi, A., Gentilucci, U. V., Bambacioni, F., Galati, G., Spataro, S., Mazzearelli, C., and Riva, E. (2007). Lower schooling, higher hepatitis C virus prevalence in Italy: An association dependent on age. *Journal of clinical virology: the official publication of the Pan American Society for Clinical Virology*, 40(2), 168-170.
- Rahat, A., & Hayat, A. (2020). Psychological Health of Children Engaged in Hazardous Labor: A Study in Lahore, Pakistan. *Journal of Policy Options*, 3(2), 70-74.
- Russo, L. (2022). The impact of slow productivity on healthcare costs in a no-growth: An empirical analysis. *Journal of Policy Options*, 5(4), 22-28.
- Singh, C. (2020). Understanding Risk and Protective Factors for Spousal Violence in the Indian Context: Implications for Prevention and Intervention. *Journal of Policy Options*, 3(2), 35-43.
- Spooner, C., & Hetherington, K. (2005). *Social determinants of drug use*. Sydney, Australia: National Drug and Alcohol Research Centre, University of New South Wales.
- Stopka, T. J., Goulart, M. A., Meyers, D. J., Hutcheson, M., Barton, K., Onofrey, S., and Chui, K. K. (2017). Identifying and characterizing hepatitis C virus hotspots in Massachusetts: A spatial epidemiological approach. *BMC Infectious Diseases*, 17(1), 294.
- UNDP. (2018). Human Development Report 2018. Oxford University Press, New York.
- Vermunt, J., Fraser, M., Herbison, P., Wiles, A., Schlup, M., and Schultz, M. (2015). Prevalence and knowledge of hepatitis C in a middle-aged population, Dunedin, New Zealand. *World Journal of Gastroenterology*, 21(35), 10224.
- Vriend, H. J., van Veen, M. G., Prins, M., Urbanus, A. T., Boot, H. J., and De Coul, E. O. (2013). Hepatitis C virus prevalence in The Netherlands: migrants account for most infections. *Epidemiology & Infection*, 141(6), 1310-1317.
- Wasley, A., and Alter, M. J. (2000). Epidemiology of hepatitis C: Geographic differences and temporal trends. In *Seminars in liver disease*, 20(1), 1-16.
- World Health Organization. (2012). Hepatitis C fact sheet. Available At: <http://www.who.int/mediacentre/factsheets/fs164/en/index.html> (Accessed on July 16, 2012).
- World Health Organization. (2016). *Global report on access to hepatitis C treatment. Focus on overcoming barriers* (No. WHO/HIV/2016.20). World Health Organization.
- World Health Organization. (2017). *Guidelines for the screening, care and treatment of persons with chronic hepatitis C infection*. World Health Organization.
- Yaseen, M. R., Aziz, S., and Aftab, S. (2014). Socio-Economic Factors Affecting Hepatitis C and Lack of Awareness: A Case Study of Pakistan. *Iranian journal of public health*, 1456-7.