



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 5, May 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.488

 9940 572 462

 6381 907 438

 ijirccce@gmail.com

 www.ijirccce.com

An Exploratory Study to Predict and Analyze HIV AIDS (ART) Diagnostics Measurements

Akshay Thorat¹, Siddharth Nanda²

U.G Student, School of Engineering, Ajeenkya DY Patil University, Pune, Maharashtra, India ¹

Faculty, School of Engineering, Ajeenkya DY Patil University, Pune, Maharashtra, India ²

ABSTRACT: Thirty years after HIV first appeared it's killed on the brink of 30 million people but transmission continues unchecked. In 2009, an estimated 1.8 million lives were lost and a couple of .6 million more people were infected with HIV [1]. To cut transmission, many social, behavioural and biomedical interventions are developed, tested and tried but have had little impact on the epidemic in most countries. This raises the likelihood of using ART not only to treat people but also to stop new HIV infections. Understood concerning the impact of very soon treatment with ART on the prognosis for on transmission and individual patients. We focus on generalized epidemics in sub-Saharan Africa, with an emphasis on South Africa, where transmission is mainly heterosexual and which account for an estimated 17% of all people living with HIV. We also make regard to epidemics among men who roll in the hay with men and injection drug users where appropriate. We are discussing the different ways during which using treatment as prevention are often taken forward knowing that this will only be the start of what must become an inclusive dialogue among all of those causes to stop all immune deficiency syndrome (AIDS).

KEYWORDS: Data Analytics, Statistics, AIDS.

I. INTRODUCTION

This dataset is originally from the WHO and UNESCO websites. The objective of the dataset is to diagnostically predict whether or not a patient has HIV AIDS, based on certain diagnostic measurements included in the dataset. Several constraints were placed on the choice of those instances from a bigger database. In the time of epidemics, what's the status of HIV AIDS across the planet, where does each country stands, is it getting any better. The data set is helpful to explore much more about above mentioned factors. In this paper, we have using some concepts like Simple Random Sampling and Stratified Random Sampling. In Simple Random Sampling each sample has an equal probability to be picked which represents that it is unbiased in terms of population sample. It is used to represent the entire population data. It is the easiest method to extract a sample data from population data. In Stratified Random Sampling, we divide the data into homogeneous sub-groups known as strata. Random samples are then selected from each of these stratum. Stratified sampling provides better inclusion of the population. Using these methods, we will find out the performance of different students categorized by gender and degree. As my dataset can be divided into groups, I used stratified sampling so that every group can participate equally into the result.

II. LITERATURE SURVEY

1. The emergence and evolution of the research fronts in HIV/AIDS research. By: David Fajardo-Ortiz,^{1,*} Malaquias Lopez-Cervantes,¹ Luis Duran,¹ Michel Dumontier,² Miguel Lara,³ Hector Ochoa,⁴ and Victor M. Castano^{5,*} Published online 2017 May 25. doi: 10.1371/journal.pone.0178293

Description: In this paper, we have learn the paradigmatic research fronts that established the basics of the biomedical knowledge on HIV/AIDS then we are identified and analyzed the emergence, structure and dynamics of A search of papers with the Acquired Immunodeficiency Syndrome" in the Web of Science (Thomson Reuters) and identifiers "HIV/AIDS", "Human Immunodeficiency Virus", "HIV-1", was carried out. A citation network of those papers was constructed. Then, a sub-network of the papers with the very best number of inter-citations (with a minimal in-degree of 28) was selected to perform a mixture of network clustering and text mining to spot the paradigmatic research fronts and analyze their dynamics.

2. Adherence to HIV treatment regimens: systematic literature review and meta-analysis: authors Altice F, Evuarherhe O, Shina S, Carter G, Beaubrun AC, Accepted for publication 14 February 2019, Published 3 April 2019 Volume 2019:13 Pages 475—490

Description:The treatment of people living with human immunodeficiency virus (PLWH) for introduction of highly effective antiretroviral therapy (ART) has transformed. A potentially fatal condition to a manageable chronic disease transformed in but when patients are optimally adherent to potent combination ART, human immunodeficiency virus (HIV). Current national guidelines within the USA recommend a mix of two nucleoside polymerase inhibitors (NRTIs) with an integrase strand transfer inhibitor (INSTI) for initial treatment in ART-naïve individuals.

3. Adherence to HIV treatment regimens: Systematic literature review and meta-analysis, April 2019 Patient Preference and Adherence Volume 13:475-49 DOI: 10.2147/PPA.S192735, Authors: Frederick Altice, Obaro Evuarherhe, Sophie Shina, Gemma Carter.

Description:in this paper we have learn, consistently taken that time when antiretroviral therapy (ART) is a mortality associated and reduces morbidity with human immunodeficiency virus and viral transmission. Suboptimal treatment adherence is related to regimen complexity and high tablet burden. Single-tablet regimens (STRs) provide an entire treatment regimen during a single tablet. This study examined the connection between STRs (vs multiple-tablet regimens [MTRs]), treatment adherence, and viral suppression.

Climate Change and Its Impact On INDIA: A Comment

The paper has examined the developing concerns looked by India with respect to environmental change. There is a pressing need to order explicit institutions, which address environment change.⁷⁰ Since, the current lawful structure in India needs vigorously with regards to execution, suitable enactments should be sanctioned by different State governments to limit emanations of ozone depleting substances and address environmental change. It might likewise be helpful to set long-term focuses to diminish emanations of these hurtful gases. There is likewise a developing need to send assets towards growing homegrown examination limit. This will help in checking the effects of environmental change in various areas. At present there is no definitive examination led on the effects of environmental change on India.

Impacts of Climate Change on Public Health in India: Future Research Directions

Investigations of environment changeability and human wellbeing show a lot of heterogeneity in the announced affiliations. This heterogeneity is somewhat because of contrasts in examination plan, yet climatic and financial contrasts that change by area likewise impact the weight of illness. It isn't evident whether results from one area can be extrapolated to others. In 2008 India built up the Public Activity Plan on Environmental Change, promising further upgrade of natural manageability as a feature of India's improvement way, flagging their contribution in the global conversation on environmental change. Nations like India have a colossal chance to manage our future direction in regards to reasonable turn of events and transformation to environmental change, however it will require the consolidated exertion of strategy producers and researchers from around the planet to address the unpredictable difficulties related with environmental change and human wellbeing.

III. PROPOSED ANALYSIS APPROACH

1. Estimating Population Parameter

In Statistics we use sample statistics to estimate population Parameters. The sample mean we are gonna use to estimating the Population Parameter

$$\bar{x} = \frac{\sum_{i=0}^n x_i}{n}$$



$$\bar{x}_i = 148371.80$$

2. Estimating Population Variance

Sample Variance is used to estimate population variance.

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}$$

$$s^2 = 267765862847.65$$

Sample variance = 267765862847.65

Standard Deviation = 516493.81

3. Computing Standard Error

The standard error is the expected value of the standard deviation of mean of several samples.

$$SE = \frac{SD}{\sqrt{n}}$$

$$SE = \frac{516493.81}{\sqrt{105}}$$

$$SE = 50404.63$$

Specify Confidence Level

Confidence level is 95%

4. Find Critical Value

Critical value is used to compute the margin of error. We will use Z score as sample size is greater than 30. To compute critical value, first we have to calculate α .

$$\alpha = 1 - \frac{\text{Confidence level}}{1000}$$

$$\alpha = 1 - \frac{95}{100}$$

$$\alpha = 0.05$$

5. Critical Probability

$$p^* = 1 - \alpha/2$$

$$p^* = 1 - 0.05/2$$

$$p^* = 0.975$$

Using Standard Normal Distribution table to find the critical value of the Z score, we got



Critical value = 1.96

6.Margin of error

The margin of error gives the amount of random sampling error in the result.

$$ME = Criticalvalue \times Standarderror$$

$$ME = 1.96 \times 50404.63$$

$$ME = 98,793.08$$

The margin of error of our sample is 1.88.

7.Confidence interval

An approximate range of values that is likely to include an unknown population parameter is given by `confidence interval ,which is calculated from the sample data.

The lower limit of the confidence interval is

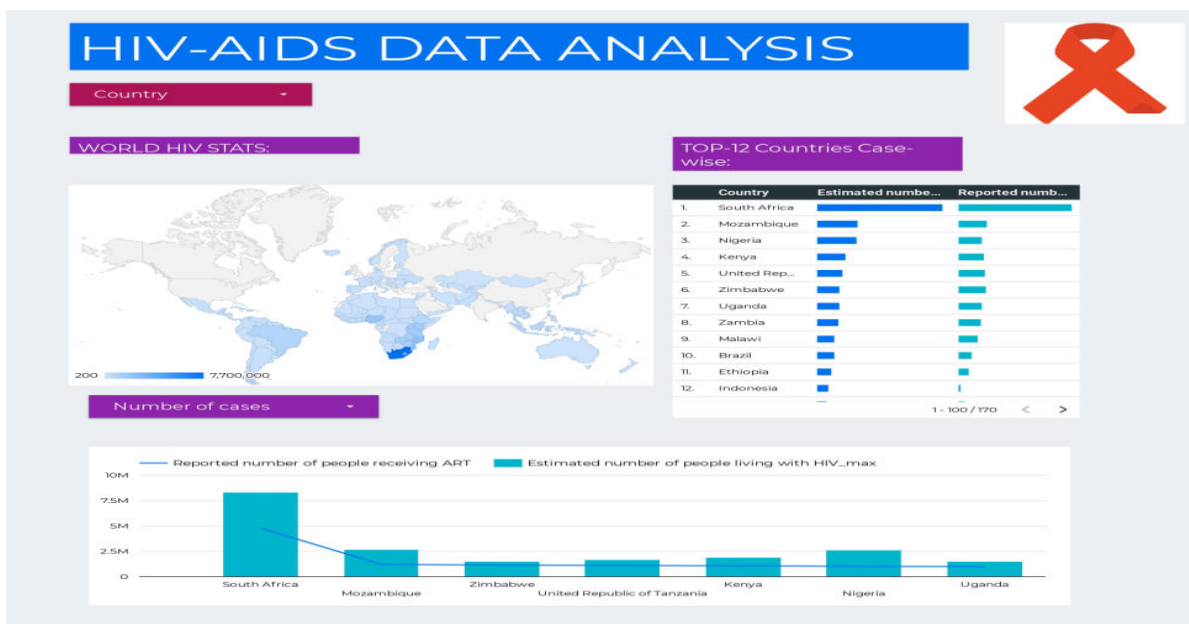
$$Cl_{min} = \bar{x} - ME$$

$$Cl_{min} = 148371.80 - 98793.08$$

$$Cl_{min} = 49578.71$$

Data Visualisations:

In this paper i analysed different HIV cases using HIV world wide data set.So this is the Report of the analysis of HIV AIDS.





Analysis Description

This section is about how we are going to visualize our dataset. And why we are taking parameters to analysis the HIV AIDS.

- 1) Geo Map on the total no. of the cases in the world (country wise).

In this total no. of cases of HIV aids are shown in a geo map from where control chart also added so that if the user moves the cursor around the map, then the user can see the the total cases recorded of the respective country in a dialogue box.

- 2) Top 12 Countries with the disease and getting the antibodies.

Here, the data is shown in bar graph with top countries with their estimated cases and the population getting the ART in descending order.



3) Estimated cases vs Reported no. of people received ART.

If there are cases, we have to make sure the people are getting the required medicine. So, here the data of estimated cases and the people got ART is shown in the form of bar graph

4) ART needed vs ART received to children (country wise).

The immune system of children is generally low so the medicine is very important for the children, so here the children who need the ART and children received the ART is shown in the form of bar chart.

5) Geo map on total children received ART.

This will help us in showing that how many of the children got ART in the world through geo map.

6) Top countries receiving ART.

This will show the top countries who received ART in the form of bar chart.

7) Total deaths recorded.

Through, geo map here the total deaths are shown, and in this project or any other healthcare analysis it's the main factor because we have decreased the deaths by predicting the cause.

IV. FUTURE SCOPE & DISCUSSION

Plans for model improvement using future population HIV care utilization data will improve model performance and external validation as we specialize in evaluating the incremental value of specific predictors (new and old) for HIV care utilization. Future data are going to be deployed to the models for model maintenance and improvement. PLWH not the use of the health system in care represents missed opportunities for re-engaging them into HIV medical aid. Without treatment as a sort of prevention, ending the HIV epidemic is harder to realize. Benefits from advances in HIV treatment also are lost for those not in care. However, investigating characteristics for those that aren't in care is difficult and expensive for health departments. The application of BDS to the present process will make substantive improvements, and permit clinicians, social workers and other stakeholders help re-engage this difficult to succeed in population back to care.

V. CONCLUSION

Data are going to be assessed for reliability to affect issues associated with missing, aberrant or extreme values. New variables and data inclusion criteria in each aim are going to be validated through chart review, HIV clinicians' expert panel and therefore the DTC community planning board. Using autocorrelation, multicollinearity and principal component analysis as guided we will reduce the dimension of the variables (number of variables) using . The focus during data management are going to be on eliminating extreme outliers, and excluding irrelevant variables and discretizing (binning) continuous variables. Appropriate methods are going to be deployed to organize for classification and prediction.

EHR from patient encounters available through the RFA and HSSC capturing information about PLWH healthcare service utilization and medications are going to be analyzed during the study. EHR data from the RFA contain information associated with encounter visits, diagnosis, laboratory services and medications (number prescribed, drug class, indication, strength and dosage). Binary variables will be created for ART status.

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7.488

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