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Global Research Output on Human Immunodeficiency Virus – From 1954 To 2022: Literature Survey

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ABSTRACT

HIV (human immunodeficiency virus) have two primary HIV strains are HIV-1 and HIV-2. Both can lead to AIDS and our work is explained to easily find out the data about HIV. We conducted the research work of HIV between the years of 1954-2022. We classified the models by their mathematical structure and research question. The amount of information that researchers are analyzing from etiology, pathogenesis, *in-vivo, in-vitro,* and human trials grows daily. As compared data for the HIV research and review work the research will perform moderately with the review work. The *In-vivo* and the *In-vitro* work are performed little lower than the other work. This is the useful research review source for the HIV research work. We created a segregation of desirable features of models, reviewed and classified the articles to inform our conclusions.

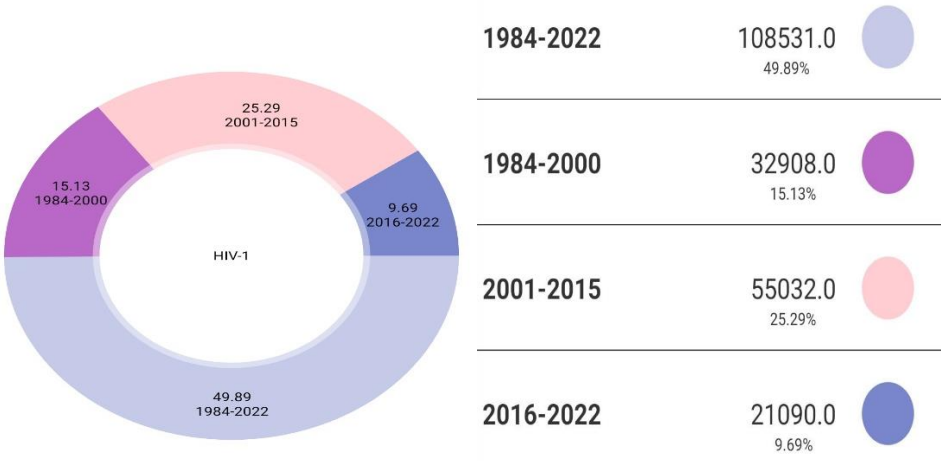
Keywords: HIV, AIDS, Etiology, Pathogenesis, *In-vivo, In-vitro,* Human Trials.

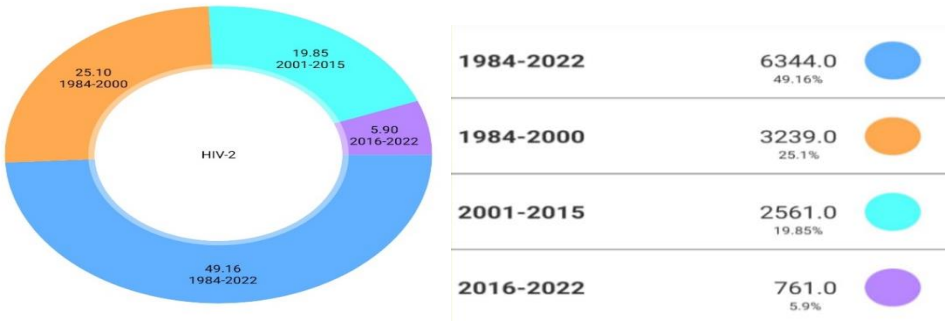
INTRODUCTION

The immune system of the organism is attacked by the HIV (human immunodeficiency virus). The two primary HIV strains are HIV-1 and HIV-2. CD4 cells are destroyed by the HIV-1 virus. These cells assist the body in battling infections. HIV-1 can seriously impair the immune system and result in AIDS.[2] Another kind of HIV-2 is an envelope retrovirus that, like HIV-1, infects people. Despite the fact that neither kind of HIV is now curable.[1] However, HIV-2 infection will develop to AIDS and mortality in the majority of people without appropriate antiretroviral medication (ART). A particular kind of chimpanzee in Central Africa is where humans first contracted HIV. According to studies, the human-chimpanzee transmission of HIV may have begun as early as the late 1800s. The virus that affects chimpanzees is known as simian immunodeficiency virus.[3] When people killed these chimpanzees for food and came into touch with their sick blood, it was likely transmitted to humans. Over many years, HIV gradually spread throughout Africa and then to other regions of the world. Since at least the mid- to late 1970s, the virus has been present in the US.[4] In the years 1980–1984 a new illness arises. According to research, HIV may be passed sexually, through the use of donated blood, injecting drugs, and from pregnant mothers to their unborn children. International repercussions are acknowledged. CDC issues protections for the country's blood supply between 1985 and 1989. Responses on a national and global scale increase. The US government organizes extensive outreach to the public. HIV transmission from healthcare workers was recorded between 1990 and 1994. The CDC publishes advice for organ transplantation and healthcare professionals with HIV. Deaths from AIDS are rising. The CDC extends its preventative initiatives to

companies, labor unions, and neighborhood associations. The number of AIDS-related deaths decreased between 1995 and 1999 when guidelines were released to prevent opportunistic infections (Ols) and to take the antiretroviral medication (HAART). The US has significant racial and ethnic differences. Africa's initiatives grow. Global AIDS initiatives and financing grew between 2000 and 2004 as a result of growing economic worries about an HIV pandemic.[5] The CDC published updated estimates of HIV incidence between 2005 and 2009 and launched new HIV prevention initiatives aimed at the general public and healthcare professionals. Global initiatives expand.[6] Between 2010 and 2014, the number of non-citizens living with HIV who can enter the US increased. Pre-exposure prophylaxis (PrEP) and treatment-induced viral load reduction have both been proved to reduce HIV transmission. Racial and ethnic imbalances still exist. In addition to extra funding of $19.2 million from the HHS Secretary's Minority AIDS Initiative Funding, CDC got $754.7 million in 2015 for HIV prevention. Programs aimed at preventing HIV were funded directly or indirectly by 89% of this money. The remaining 11% was used to support initiatives focusing on crosscutting issues and other linked illnesses, such as sexually transmitted diseases (STD), TB, and viral hepatitis, as well as to meet agency statutory expenditures, such as Public Health Service assessment.[7] The COVID-19 vaccination and risk for HIV infection are not related in 2020. The COVID-19 vaccinations enhance the immune system's capacity to fend off the disease and shield recipients from its more serious side effects. The COVID-19 vaccination is safe for HIV-positive individuals. The Food and Drug Administration's strict scientific requirements for safety, efficacy, and manufacturing quality are met by COVID-19 vaccines, which have undergone clinical testing on individuals with HIV. There isn't a remedy that works right now. People who get HIV are permanently infected. But HIV can be managed with the right medical attention. When receiving good HIV therapy, people with HIV can live long, healthy lives and safeguard their relationships.[8] At the end of 2021, there were 38.4 million [33.9–43.8 million] HIV-positive individualsWorldwide.[9] The 2030 deadline for ending the HIV/AIDS pandemic as a significant public health hazard and achieving universal access to ARV medications for HIV prevention and treatment are both supported by the 2021 Consolidated Guidelines on HIV. The 2030 targets to eradicate AIDS, viral hepatitis B and C, and sexually transmitted infections are guided by the global health sector strategies (GHSSs) on HIV, viral hepatitis, and sexually transmitted infections, respectively.[10]

Fig.no1: Data of publication Human Immunodeficiency Virus-1 and 2 from 1984-2022





AIM

In this work aim to collect and list out data to published in various sources of HIV research and tabulated by Etiology, Pathogenesis, *In-vivo*, *In-vitro* and clinical trials categories in between the duration of 1954-2022 years. This will be useful for the researchers to easily find out the research data about HIV data analysis.

MATERIALS AND METHODS

DATA SOURCE

The information provided here is entirely gathered from internet resources like PubMed, Elsevier, Google scholar, Web of science and Scopus.

DATA EXTRACTION

The papers that emerged from the literature search were catalogued by publication year, journal name, quantity of results retrieved, and paper content.

ETIOLOGY STUDIES

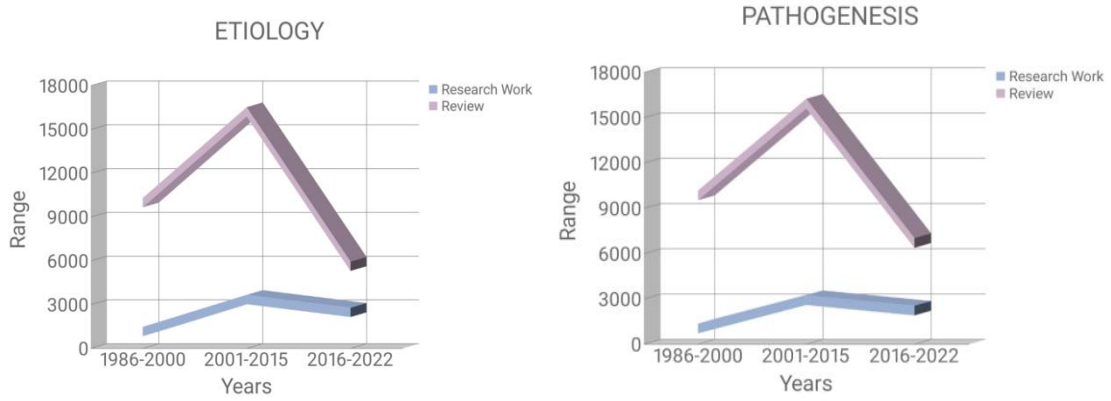
The etiological facts provided here are used to draw the issues and core information that will clearly explain the etiology (i.e., causes of the disease). The HIV etiology describes how the virus infects cells, produces virus, multiplies virus, and worsens the disease.

Table no.1: Date of Publication Etiology studies from 1954-1985[11-21]

S.NO	TYPE OF ARTICLE	DURATION	TOTAL NUMBER
1.	Systemic Review	1954-1985 1986-2000 2001-2015 2016-2022	- 22 834 1,087
2.	Review	1954-1985 1986-2000 2001-2015 2016-2022	29 9,986 16,214 5,624
3.	Randomized controlled trial	1954-1985 1986-2000 2001-2015 2016-2022	- 1,139 3,836 1,475

4.	Meta-Analysis	1954-1985 1986-2000 2001-2015 2016-2022	- 49 697 869
5.	Clinical trial	1954-1985 1986-2000 2001-2015 2016-2022	1 2,524 5,885 2,149
6.	Books and Documents	1954-1985 1986-2000 2001-2015 2016-2022	- 4 10 19
	ARTICLE ATTRIBUTE	**DURATION**	**TOTAL NUMBER**
7.	Associated data	1954-1985 1986-2000 2001-2015 2016-2022	1 1,315 22,487 23,709

Fig.no 2: Data of publication HIV Etiology and Pathogenesis from 1986-2022



PATHOGENESIS STUDIES

The information for the pathogenesis is chosen based on the items described in the title and the material that clearly show how the disease got started.

Table. No 2: Date of Publication Pathogenesis studies from 1954-1985[22-32]

S.NO	TYPE OF ARTICLE	DURATION	TOTAL NUMBER
1.	Systemic Review	1954-1985 1986-2000 2001-2015 2016-2022	- 20 767 1,068

2.	Review	1954-1985 1986-2000 2001-2015 2016-2022	29 9,861 15,939 6,705
3.	Randomized controlled trial	1954-1985 1986-2000 2001-2015 2016-2022	- 1,094 3,525 1,693
4.	Meta-Analysis	1954-1985 1986-2000 2001-2015 2016-2022	- 44 638 793
5.	Clinical trial	1954-1985 1986-2000 2001-2015 2016-2022	1 2,465 5,702 2,477
6.	Books and Documents	1954-1985 1986-2000 2001-2015 2016-2022	- 7 18 18
	ARTICLE ATTRIBUTE	**DURATION**	**TOTAL NUMBER**
7.	Associated data	1954-1985 1986-2000 2001-2015 2016-2022	1 1,316 21,270 26,201

IN-VIVO STUDIES

Many researchers have conducted *in-vivo* investigations for this, with reliable results that indicate thorough and balanced sorts of conclusions in these studies, which were chosen based on their themes and contents.

Table.no 3: Date of Publication *In-Vivo* studies from 1954-1985[32-42]

S.NO	TYPE OF ARTICLE	DURATION	TOTAL NUMBER
1.	Systemic Review	1954-1985 1986-2000 2001-2015 2016-2022	- - - 3
2.	Review	1954-1985 1986-2000 2001-2015 2016-2022	57 6 29 25
3.	Randomized controlled trial	1954-1985 1986-2000	- 3

		2001-2015 2016-2022	3 1
4.	Meta-Analysis	1954-1985 1986-2000 2001-2015 2016-2022	- - - 2
5.	Clinical trial	1954-1985 1986-2000 2001-2015 2016-2022	- - 5 4
	ARTICLE ATTRIBUTE	**DURATION**	**TOTAL NUMBER**
7.	Associated data	1954-1985 1986-2000 2001-2015 2016-2022	- - 19 40

Fig.no 3: Data of publication HIV *In-Vivo* and *In-Vitro* from 1986-2022

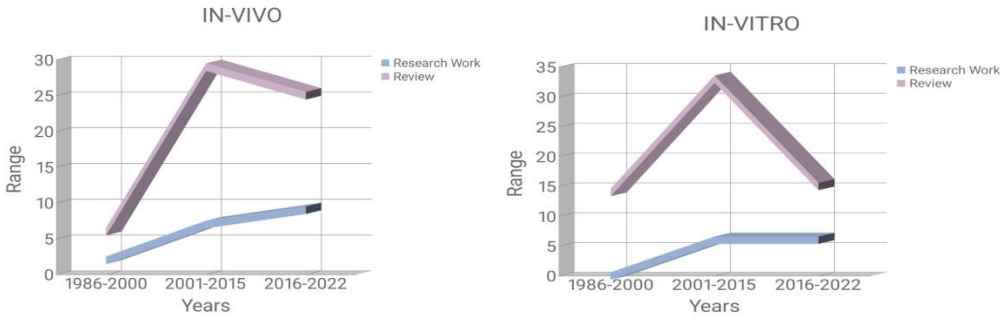
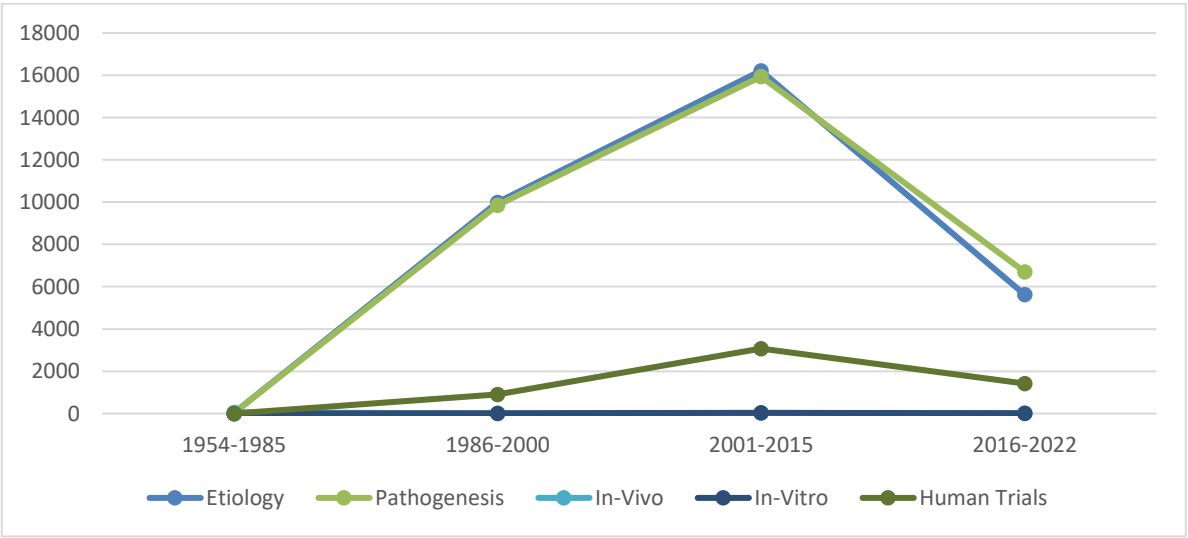


Fig.no 4: Comparative studies for HIV in Review Research Work



IN-VITRO STUDIES

Based on the subjects and scope of the studies our study has chosen, *in-vitro* experiments are carried out on the exterior of the animals.

Table. no 4: Date of Publication *In-Vitro* studies from 1954-1985[42-52]

S.NO	TYPE OF ARTICLE	DURATION	TOTAL NUMBER
1.	Systemic Review	1954-1985 1986-2000 2001-2015 2016-2022	- - - 2
2.	Review	1954-1985 1986-2000 2001-2015 2016-2022	1 14 33 15
3.	Randomized controlled trial	1954-1985 1986-2000 2001-2015 2016-2022	- 4 15 7
4.	Meta-Analysis	1954-1985 1986-2000 2001-2015 2016-2022	- - - 2
5.	Clinical trial	1954-1985 1986-2000 2001-2015 2016-2022	- 7 6 10
	ARTICLE ATTRIBUTE	**DURATION**	**TOTAL NUMBER**
7.	Associated data	1954-1985 1986-2000 2001-2015 2016-2022	- 2 51 63

HUMAN TRIALS STUDIES

Strategies for HIV vaccination are anticipated to be essential for containing the HIV pandemic. The whole development process of an effective HIV vaccine approach is time-consuming, despite the wide range of prospective candidate vaccines for both preventive and therapeutic usage. Clinical trial design and the advancement of a candidate approach through the various clinical development phases continue to provide methodological challenges, primarily since there are no validated correlates of protection. To improve the effectiveness of the clinical development of potential HIV vaccine tactics, we present current developments in clinical trial designs in this study. With consideration for the unique characteristics of both preventive and therapeutic HIV vaccine development, the methodological features of the designs for early- (phase I and II) and later-stage (phase IIB and III) development are explored.

Fig.no 5: Data of publication HIV Human Trials from 1986-2022

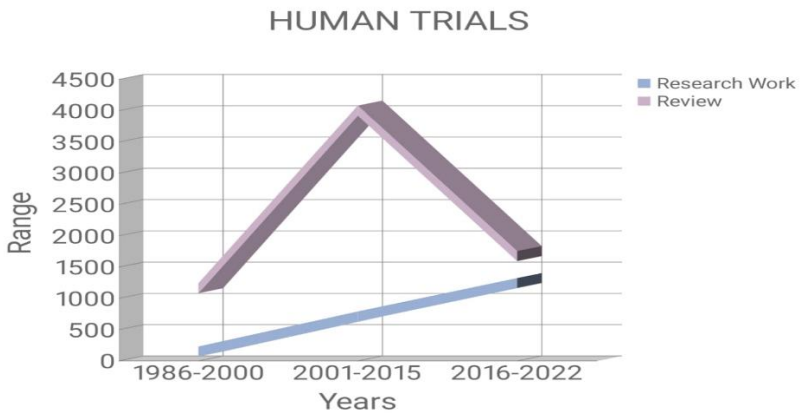
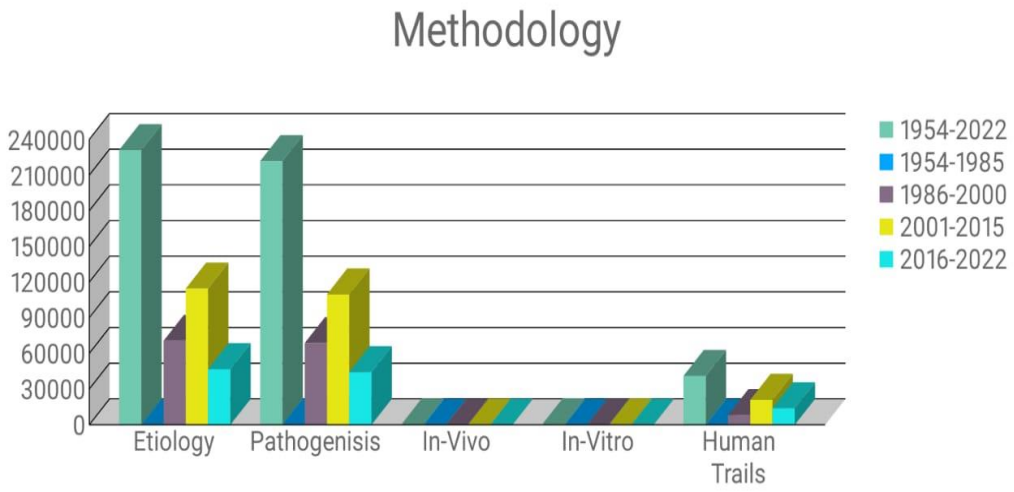


Fig.no 6: Research trends in HIV



DISCUSSION

This review research work is based on the how much research and review works will do in the past decades. The decade was between 1954 to 2022. In those years many works were performed, but few may give complete results some will give moderate results. In this our work will get separated us by etiology, pathogenesis, In-vivo, In-vitro, Human trials with all these the data are segregated by year wise. The years were divided between 1954-1985, 1986-2000, 2001-2015, and 2016-2022. In this all these years the data are entered in certain categories (i.e.) systemic review, review, randomized controlled trial, meta-analysis, clinical trial, books and documents and associated data. The review data is higher than the other data performed. The *In-vivo* and *In-vitro* studies are performed lower rates. The books and documents for HIV are found lower rate. The comparative studies are performed in this among research work and review work. As we compared the resultant data for this is that research is less than that of the review work. As we hope that, this is very useful work for the HIV research who need the overall and specific data for the years between 1954 to 2022.

Table.no 5: HIV publishing data

Origin	HIV	Etiology	Pathogenesis	*In-vivo* Research	*In-vitro* Research	Human Trials
Asia	24,004	13,469	11,989	63	223	1,497
Africa	60,191	29,453	26,904	278	682	6,190
Antarctica	10	6	-	-	7	-
Australia	11,013	5,887	5,535	288	467	1,101
Europe	25,395	15,234	13,915	3	16	1,508
North America	45,137	19,647	16,885	4	11	3,145
South America	8,062	4,764	4,337	-	3	549

CONCLUSION

According our review of research will give a complete detail of HIV published work from the year 1954-2022. The data are clearly segregated in this work and that will easily get concluded. Here the data are taken in the internet sources. There is no other literature review work for the HIV. We hope it is a knowledge source for young scholars who are committed to research in HIV they access the data in a time consumed manner.

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Conflict of Interest: Nil

Source of funding: Nil

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