Chapter III
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The research process is a special and powerful mode of thinking. It yields an understanding of how related events behave, and will often provide ways of coping with the environment. It comprises all the methods of gathering numerical data and drawing conclusions about their characteristics and their behaviour. The kind of data selected for study is determined by past developments in the field in which these data belong. The actual methods used in arranging them and drawing the conclusions belong to statistics.

In many respects the value of knowing how research is done is greater for librarians, archivists, and information scientists than for most other professionals. To understand why this is so, it is useful to explore several propositions about the name of the research and the role of the librarian.

Research yields new findings. These are critical to opening large scale analyses of library or information networks or individual libraries or information centers. That is, the very basis of rational management that depends on information. The goal of research is to provide information that is reliable and valid, so that decision making by librarians and by those whom librarians serve can be optimally beneficial.
Research and Development activities in each field are acknowledged on the basis of the investigations into identified problems. There are new approaches to settle scientific paradigms, searching for new research prospects with the task of giving theoretical maturity with factual foundations. This aspect of methodological research is based on established research results which are accepted scientific truths.

It is a universally recognized fact that the methodology of a scientific branch is an integral, inseparable part of that scientific branch along with its history and organization. Methodology of any scientific branch is considered to be formed when more and more of investigations are undertaken.

"In Library & Information Science, librarians as mediators between recorded information and users, they must be able not only to locate information but also to interpret or evaluate this information for patrons.,“ 69.

I.K.Ravichandra Rao 70 specifies three levels in research. "The philosophical level helps scientists to orient themselves in the system of scientific knowledge, makes research more disciplined, helps in its evolution in taking the scientific knowledge from earlier generation to later ones.


The general scientific level of methodology is critical, estimative and corrective. Its main objective is research activity, a process in which scientific knowledge is created as well as analysis of forms, methods and results of the activity.

The special level or methodology grounds the place of branch of science in the system of sciences identifying laws and regularities specific to this branch of science, essential qualities of its research objects and universal nature”.

The present study belongs to the second level and is concerned with a bibliometric analysis of scientific literature output on AIDS. It aims to apply the empirical laws of bibliometrics on the data/records of AIDS literature. The study includes an analysis of AIDS literature as covered by MEDLARS7\ between 1991 and 2000 in the context of country of contributions, language of contributions, authorship pattern and percapita aspects of contributions. Further the study tries to identify the course of trend in AIDS research as revealed by literature output in the subject. Based on the analysis, the study aims to arrive at future course of projections in authorship pattern, language and country of publications. In addition, the study proposes to apply the empirical laws of Lotka, Bradford and Zipf and the corollary proposed by Naranan.

The study is mainly exploratory in nature in identifying the research output of scientists in AIDS and is also analytical in nature with suitable statistical tools application in strengthening the empirical validity.

3.1 Choice of the Topic

Bibliometric Analysis as a subject of study and its application, when compared with many other subject fields, is of recent origin in Information Science attracting scholars to work on its various aspects as evaluation of information plays a vital role in policy making and economic planning.

The availability of immense, accurate and up-to-date economic and technical information on the basis of periodical evaluation has been recognised by industrialised nations and corporations.

AIDS which is a global menace, has been haunting the social progress of developing nations including India. Enormous time, research manpower and money is spent on the causes, diagnosis, prognosis and curbing of the disease. AIDS has a multidimensional face including psychological, sociological, geographical, ethical, medical and economical aspects. Hence, as an application target, AIDS literature has been chosen.

The topic for research investigation is "Growth And Collaboration Trends In Acquired Immune Deficiency Syndrome Research Literature: A Bibliometric Analysis"
3.2 Objectives

The researcher has framed the following objectives by keeping the content and meaning of the study:

1. To identify the quantum and structure of AIDS literature covered by MEDLARS during the decade spanning between 1991 and 2000;
2. To examine the growth of Aids Literature output during the ten years between 1991 and 2000;
3. To identify the source and country-wise distribution of global Aids research literature output.
4. To compare and measure the growth rate of AIDS literature of India in relation to some selected countries.
5. To analyse the authorship pattern of aids literature published from various countries.
6. To study the trend in authorship pattern
7. To analyse the degree of single versus multiple authored publications
8. Application of Lotka's authorship productivity concepts on the frequency distribution of authorship productivity.
9. To track the development of aids literature and its language of publication during the period of coverage.
10. To analyse the trend in the language of publication on aids literature
11. To study the language of the publication in the context of quantum of pages
12. To study the frequency distribution of applications in the context of country wise breakdown.
13. To analyse the contribution from various countries in the context of quantum of pages of output
14. To analyse quantitatively the annual literature output in aids research.
15. To identify the variety of publications on aids literature
16. To analyse the trend among the various types of publications
17. Application of Zipf’s law\textsuperscript{73} to frequency distribution of words in the literature on aids.

3.3 Hypotheses

The researcher has formulated following set of hypotheses fulfilling the purposes of the study:

1. Research literature output from a country is related to its economic growth


\textsuperscript{73}Gayatri Mahapatra, Bibliometric studies. New Delhi: Crest publishing house, 2000. pp.2
2. The quantum of AIDS research literature output from a country is related to the incidence rate of AIDS in that country.

3. Scientists prefer to publish their contributions on AIDS in journals published from developed countries.

4. Collaborative research output has replaced individual research in many areas in Science and hence, in AIDS research literature output too.

5. The frequency of words in AIDS research literature is in conformity with the zipf's law.

6. The scientific productivity of authors in AIDS research literature confirm to the Lotka's inverse square law of scientific productivity.

3.4 Methodology

This investigation entitled "Growth and collaboration trends in Acquired Immune Deficiency Syndrome Research Literature: A Bibliometric Analysis" is a case study encompassing records output on AIDS from the Medical Literature Analysis and Retrieval System (MEDLARS) available on CD-ROM diskettes.

3.5 Sample Size

Records for the bibliometric analysis have been downloaded from MEDLARS CD ROM database. The fields selected for the download included Author, Title, Source, Language, Country, Year. The size of the
sample downloaded for the purpose is 43468. This is a case study involving the analysis of behaviour of aids literature output in its wholeness between a break free period of 1991 and 2000.

According to Pauline V. Young, "case study is the analysis of a situation, family or a social institution during a particular period of time"\textsuperscript{74}.

The size of the sample in this investigation is a database of 43468 records.

\textbf{3.6 Data Collection}

There are various sources contributing to the research output in the field of AIDS. In this study, bibliographic records have been downloaded from the MEDLARS Database on CD ROM with permission from The Arvind Eye Hospital, Madurai. The bibliographic data thus downloaded includes journal articles, books, conference proceedings, editorials, letters, News, comments etc. The search terms used for downloading was AIDS.

The records downloaded through the key term "AIDS" brought all the records whichever contained the word in them. Therefore, all the records downloaded were subjected to ISO 2709 conversion and then imported into CDS-ISIS ver.3.06.75 All the' pollutant records' not belonging to the core subject "AIDS" were removed and the resulting records were consolidated. It resulted in a database of 43,468 records which formed the sample for this study.

\textsuperscript{74} Young, Pauline V, Scientific social surveys and research. New Delhi: Prentice Hall of India (P) Ltd., 1975

\textsuperscript{75} UNESCO. CDS-ISIS, ver.3.07, New Delhi: NISSAT India, DST, 1992.
3.7 Statistical Tools

Keywords filtered and finalized records after the CDS-ISIS process were finally imported into MS-ACCESS for statistical analysis. Laws, principles of Bradford, Lotka, Zipf and Naranan have been applied for inferences. In addition, general statistical principles and formulae governing Regression Analysis, Trend Analysis have been applied wherever required.

3.8 Regression Analysis

The multivariate analysis technique namely multiple regression has been used by the researcher. The purpose of using this technique is to predict the number of publications for the near future i.e. 2001, 2002, 2005 and 2010. The year has been considered as the independent variable and number of publications is considered as the dependent variable. The researcher has collected data for ten years (1991 - 2000) and using simple linear regression method to projections are made.

The regression equation\(^6\) is

\[ y = a + bx \]

where 'y' is the dependent variable (No of publications), 'x' is a independent variable (the reference year), 'a' and 'b' are the constants.

Regression analysis has been applied to the concepts of authorship pattern, quantum of pages output, types of publications, language wise literature output and country wise literature output.

\(^6\) Op. cit. 69, p 73.
3.9 Bibliography - Style

The prescriptions provided in the 'Chicago Style Manual' has been followed with small variations which is related to the rendering of the Indic names wherein the reversing of names has not been done. All the Indic names have been rendered in their natural sequence with initials at the end.

3.10 Limitations

The study covers a period of ten years only spanning between 1991 and 2000, both years inclusive. Records for the analysis of this investigation have been downloaded from MEDLARS database available CD-ROM format. Database of Records taken for analysis is exclusively from MEDLARS which follows its own standard for the inclusion or elusion of sources. Though data may exist outside MEDLARS in ample, this investigation has not included any from other sources or online database. Generalisations have been done based on the data pertained the ten years period.

Though the geographical entity 'U.S.S.R.' seize to exist, records enumerated under that country's name in MEDLARS has been accepted this investigation.