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- **ASSESSMENT OF COVERAGE AND INFRASTRUCTURE OF EMPLOYEES' STATE INSURANCE SCHEME**
- **INTRODUCTION TO SYSTEMATIC REVIEW AND META-ANALYSIS**

A Report by

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List of Abbreviations

AYUSH: Ayurvedic Yoga Unani Siddha Homeopathy

CAIU: Central Analysis and Intelligence Unit

CGHS: Central Government Health Scheme

ESIC: Employees' State Insurance Corporation

ESIS: Employees' State Insurance Scheme

HI: Health Insurance

ILO: International Labor Organization

IMOs: Insured Medical Officers

IMPs: Insured Medical Practitioners

ISM: Indian System of Medicine

NCR: National Capital Region

OOP: out of pocket

OPD: Out-Patient Department

PHFI: Public Health Foundation of India

UTs: Union Territories

WHO: World Health Organization

ABOUT PUBLIC HEALTH FOUNDATION OF INDIA

The Public Health Foundation of India (PHFI) is a public-private enterprise that has synergistically advanced through deliberations with multiple districts including national and international academia, state and central administrations, multi & bi-lateral authorities, and public society groups. PHFI is a retort to retribute the limited institutional scope in India for reinforcing training, research, and development to policy in the expanse of Public Health. Formulated as an autonomous foundation, PHFI implements an extensive, consolidative method to public health, adapting its endeavours to Indian circumstances and bearing significance to nations facing similar encounters and apprehensions. The PHFI emphasizes comprehensive proportions of public health that incorporate promotive, preventive, and therapeutic facilities, many of which are recurrently lost sight of in policy devising as well as in prevalent awareness. The Prime Minister of India, Dr. Manmohan Singh, commenced PHFI on March 28, 2006, in New Delhi. PHFI distinguishes the fact that meeting the deficit of health professionals is indispensable to a uninterrupted and holistic answer to the public health anxieties in the nation which in turn necessitates health care to be undertaken not only from the systematic view of what works but also from the societal viewpoint of, who desires it the most.

VISION

The vision is to fortify India's public health systems' competence and provide information to realize better health consequences for all.

MISSION

- Evolving the public health personnel and setting standards
- Progressing in public health research and expertise.
- Establishment of knowledge utilization and evidence-briefed public health training and policy

- VALUES
- *Transparency*
- *Impact*
- *Informed*
- *Excellence*
- *Independence*
- *Inclusiveness*

- Various projects undertook by PHFI is included in different sectors of public health like-
- "HIV prevention, antibiotic resistance, health professional training, routine immunization, universal coverage, environmental health, public health cadre development, health workforce planning, tobacco control, health accounts and budgeting and affordable technologies development."
- The well-acknowledged research officers and faculties of PHFI are dynamically contributing to many ingenuities like "Ending child Obesity by WHO Commission, mental health, health professional education by Lancet Commissions, investing in health, etc."
- Apart from these various transnational conferences have been organized by PHFI on numerous themes like "antibiotic resistance, the endgame for tobacco, maternal health, health in sustainable development, global youth meet on health, new directions for public health education."

Work from Home

Under the political and administrative obligation of preventive lockdown to curb the infecting rate, the pandemic also procreated an opportunity to learn from the click instead of the brick. Restriction on travels focussed on the progressive method of online education. A maintained balance and co-ordination in work and the home was another unforeseen advantage of this take of education. Increasing the dexterity and proficiency of skills by imbibing and inculcating the habit of paperless communication had positive ecological outcomes as well. Reiteration of tasks was one of the limitations without any actual development of interpersonal relationships

among colleagues. Regardless of the problems, PHFI coped up very well with the circumstances providing an amazing opportunity of learning and internship, without any hindrances ado.

SWOT ANALYSIS OF THE Work from Home at PHFI.

STRENGTHS	WEAKNESS
• Competent mentors and teachers. • Practicing physical distancing. • Work and home balance. • Ease of accessibility to data. • Compliance with changing circumstances. • Shared decision making.	• Reiteration of tasks. • Interruption in networks. • Decreased interpersonal communication between colleagues. • Power cut issues.
OPPORTUNITY	**THREATS**
• Inculcating paperless working. • Skill development in virtual learning. • Open environment for the prosper of ideas. • Participation in the multiple, relevant researches.	• Risk of modified work environment. • Incoordination in timing of work among the colleagues. • Inability to learn from experience of mentors.

Part 1- REPORT ON RESEARCH PAPER

ASSESSMENT OF COVERAGE AND INFRASTRUCTURE OF EMPLOYEES' STATE INSURANCE SCHEME

ABSTRACT

Introduction

Employment State Insurance Scheme (ESIS) is a self-financed, unified and multifaceted Indian social security system for the employees and their dependents of the organized sector of employment, covering and encompassing the whole nation. With the launch in 1952, the Employment State Insurance Corporation (ESIC) panels the suitable country-wide functioning of ESIS. This health insurance scheme favors the employees' medical care, sickness, maternity, disability, death and other matters of compensation and financial protection due to occupational hazards in factories commissioning 10 or more persons and establishment commissioning 10 or 20 or more persons relying on the norms of different States, in the notified zones. This is accomplished with the minimal contribution paid in form of premium. The scheme refuges the insured people and their dependents as well, in their incapacity to work or restore to normal health. Attaining societal safety by providing monetary benefits and cash payments in hours of need for the workers of the organized sector is foremost goal of the scheme.

Objective of the study

The objective of the study is to assess the coverage and infrastructure under the ESI corporation over the year 2000 till 2018 and interpret the trend and patterns wherein the corporation is lacking to implement effective and efficient ways to provide social security to the labor class. It also aims to assess the extent and dimension of coverage and

infrastructure under ESIC over a time period of 2000-2018. It advises recommendations for scaling up the ESIS to provide social security as well.

Methodology

Using a descriptive design, this study extracts secondary data from ESIC Annual Reports from 2000 to 2018. Addressing various indicators pertaining to the coverage and infrastructure of the nationwide scheme, this study provides a comprehensive and elaborative understanding for the giant strides made by the Act through the time period. Sequentially, this evaluates the accessibility, availability, thereby the progress of the ESI Act.

Findings

It accounts for the prodigious growth in the geographic-demographic coverage, multidimensional services and ever-extending infrastructure of the Act. The ESIS has been extended up to 34 States/UTs and to total beneficiaries are as high as 13.32 crore. Reduced number of inspection and surveys was another conclusion drawn. The large disparity between the total number of beds commissioned and the beneficiaries was a distinct outcome. AYUSH along with ISM services needs to make larger and more impactful establishments at various regions of the country to further increase the coverage and infrastructure of ESIS.

Recommendations

This study also enlists some recommendations concerning the breaches encountered while the undertaking the research. The scope and infrastructure of the act is very important to assess the extent of accessibility and availability of the scheme to the general population. Extension of ESIS to Ladakh and Sikkim would help in provision of services to all the States and Union Territories. Increase in inspections and surveys for monitoring, evaluation and directed functioning of the ESIS is necessary. The number of beds and diagnostic facilities should increase proportionately with the number of insured persons. The coverage should be extended to informal/unorganized sectors like the agricultural workers, small- and medium- scale businesses too encompassing the disparities like migration.

Keywords Health insurance, ESIC, Coverage, Infrastructure.

I. INTRODUCTION

Employment State Insurance Scheme (ESIS), managed by Employee's State Insurance Corporation (ESIC), an autonomous corporation under the Ministry of Labor and Employment, Government of India following the rules and regulations specified in the ESI Act, 1948. ESIS is a multifaceted scheme with an objective to protect to employees and their dependents from risks such as medical care, health and disability, death in office, catastrophe services, compensation management, etc., ESIS protect from uncertainty and loss of money and income as a result through Medical benefit, Sickness benefit, Maternity benefit, Disablement or confinement benefit for women; Dependents benefit (pension), Funeral benefit and Rehabilitation allowance to employees of the organized sector. *(National Health Portal of India 2015)*

ESIS cover protects the insured from the first day of his insurable employment. It offers medical cover for certain diseases and provides cash benefits during medical leave. The cash benefit extends up to a maximum of 70 percent of the wages payable to the employee for 91 days. The scheme includes Maternity benefit up to 26 weeks which is extendable by further one month on medical advice. In case of a miscarriage also such benefit stands applicable. The scheme provides cover to the insured and dependents against sudden loss of income arising from sickness and accidents while at work, in the form of monthly installments. The insured are eligible for the benefit for at least three years, in case they declare information about their previous employment. In the event of temporary disablement of employees, 90 percent of the wages are payable till the time of their recovery and in case of permanent disability, the same can be availed for their entire life. The scheme offers Funeral Expenses of Rs. 10,000 in an event of the death of the insured. Other benefits include vocational and physical rehabilitation and old-age medical care. *(Ministry of Labour and Employment 2019)*

History and Emergence of ESIS: Since British Raj, Indians worked in factories, industries, and other businesses but without any provision of financial support during times of sickness or even death. However, after independence the government of India came forward for the protection of these workers, providing them with the first principal legislation for social security with the ESI Act 1948.

The British ruled India took the first foundation step in 1885 when compensatory monetary help was provided if the workmen suffered from any lethal industrial accidents due to noticeable negligence of the industries. Soon replaced by a more inclusive scheme of "Workmen's Compensation Act", 1923 to deliver more relief. The insufficiencies and recommendations of this Act were brought about by the Royal Commission of Labor which persuaded the Government of India to form a man panel- Prof. B.P. Adarker in March 1943. The comprehensive report provided by the panel acted as a preliminary way to the "Sixth Indian Labor Conference" *(Centre for Occupational and Environmental Health 1996)* Under the guidance of this report and propositions from ILO experts, the national government revised the original health scheme to prepare "Employee's State Insurance Bill" which finally became a law on April 19, 1948. *(Centre for Occupational and Environmental Health 1996)*

Originally called "Workmen's State Insurance Bill" *(Kannan, K., and N, V 2007)*, this act became a pioneering measure in social insurance in India by acting as a multidimensional social security system tailored to provide socio-economic protection to workers and even their dependents covered under the scheme. To achieve socio-economic justice this act caters to the age of industrialization and collective labor awareness towards privileges and obligations. *(Gopinath and Krishna 2010)*

The Employees State Insurance Scheme was bought into force in 1952, Delhi and Kanpur. The scheme was being implemented across the country since then and presently, the scheme is open for employees in more than 843 Centers in 34 States and Union Territories. Around 10.33 lakh factories and establishments subscribe to the ESI Act and over 3.43 crore individuals are insured under the scheme. It holds a record of over 13.32 crore beneficiaries. *(ESIC Annual Report 2017)*

Employees State Insurance Act, 1948: ESIS is a program of Government of India aiming to offer Social Insurance to employees and their dependents as per the provisions of the Employees' State Insurance Act 1948. Its purpose is to ensure a monetarily secured future for employed individuals and dependent members in their families, from unforeseen incidents of illness, temporary and personal disablement, maternity, and death and physical injury caused while being employed. The Employees State Insurance act was the first important legislation on the social security of workers in independent India and was promulgated in our parliament by the Union Labor Minister Shri. Babu Jagjivan Ram. The first person insured under the scheme was our honorary Prime Minister Shri Jawaharlal Nehru.

The employees working in small business units like shops, malls, restaurants, cinemas, educational institutes, and medium and small enterprises such as factories, newspapers, and the transport industry are eligible to get the benefit of the ESI Scheme. All employers who employ a minimum of 10 employees are eligible to register their employees under the scheme while in some states; these benefits are extended to units and employers that have 20 employees or more. The scheme is applicable for employees who earn a monthly wage of a minimum of Rs. 15,000 and the ESIC have decided to increase the capping on a monthly wage from Rs. 15,000 to Rs. 21,000. The benefits have been extended to employees of construction sites located in certain areas as stated by the ESI corporation since 1st August 2015. *(Ministry of Labour and Employment 2019)*

ESIS is a self-financed scheme funded by the contributions of both the employer and employee. The employer contributes 4.75 percent of an employee's wage towards the scheme while the employee chips in 1.75 percent of his/her wages for the scheme. However, employees who receive less than Rs. 137 as their daily wages have been exempted from contributing towards the scheme. Only their employers are liable to make the required contributions.

Employees State Insurance Scheme and its Application: ESIC is a statutory corporate body established by the Employees' State Insurance Act 1948, to undertake the responsibility of seamless administration of the ESIS and its management. The ESI scheme

offers medical benefits to the insured employee and his/her dependent family members against certain specific illnesses, death due to physical injuries at the workplace, and temporary and permanent disabilities.

The headquarters of ESIC is in New Delhi and has an extensive network across India. ESIC further functions are carried out by 62 regional, sub-regional and divisional offices across India. Currently, ESIC has a network of 154 hospitals and 42 hospital annexes for inpatient services. A wide network of around 1500 ESI dispensaries, 314 AYUSH Units, and 954-panel clinics provide free and discounted Primary and out-patient medical services to applicable employees and other members across the country. Additionally, there is also a Medical Benefit Council that is established to offer their expert guidance to the ESIC regarding its administrative duties. To facilitate the monthly payouts and other deliverables, ESIC is supported by around 630 branch offices and 185 pay offices. *(ESIC Annual Report 2017)* To ensure the least impact of vocational hazards ESIS has established five occupational disease centers each in Mumbai, New Delhi, Chennai, Kolkata, and Indore for the benefit of individuals working in potentially hazardous industries.

Benefits of ESIS: ESIS under the purview of the ESI Act, 1948, provided the benefits to employers under the Scheme, by absorbing all their responsibilities of providing medical facilities to employees. Employers can provide Maternity Benefit Act to their employees without being financially burdened. They can have their employees covered under the ESIS. Employers get relieved of the worries about the sickness of workers, injury, or physical disability which causes a lack of production and also gives them cover resultant financial liabilities, as the responsibility of paying the benefits to the insured employees is upon the ESI Scheme. Further, any contribution made to the ESI Scheme is eligible for a deduction in computing the Income Tax payable by the employer.

ESIS provides a plethora of benefits to the employees also. The health care of the employees is provided by creating a dependable, affordable medical infrastructure to the employees through a wide network of hospitals, clinics, and dispensaries. The scheme also reimburses the unforeseen expenses in event of being affected by certain diseases to the insured employee and his dependents in the form of cash benefits. This benefit is paid for

a term of 91 days and to an extent of 70 percent of the wage provided the insured has contributed for 78 days in a contribution period of 6 months.

Maternity benefits and benefits for miscarriages and medical termination of pregnancy are also payable as per laid down rules. This benefit can be extended up to 26 weeks, and further by one month on medical advice at the rate of full wage.

If the employee goes through any health hazards or injuries while at work, he and his dependents need not worry about the monetary crunch that may arise due to the sudden loss of income. The scheme offers monthly payouts to the insured.

Beyond the health benefits, the scheme also ensures proper social security of the employees in case of unforeseen unemployment because of the closure of unit or establishment, reduction of workforce by the employer, or permanent invalidity. In such a case, 50 percent of the salary of the insured employee will be paid every month for up to 2 years by the scheme. In case of temporary disablement due to injury while at work, ESIS will pay up to 90 percent of the wage of the insured till the injury is healed. The scheme would pay 590 percent of the wage lifelong if the disability is permanent. In case of death of the insured the scheme offers to pay Funeral Expenses of Rs. 10,000. Other benefits include vocational and physical rehabilitation and old-age medical care.

The Scheme is aiming at the overall improvement of the social living standards of the country by providing better health and security to the working class where they can look forward to better tomorrow by contributing a very small amount of their income towards health insurance (HI). It also aims to give the employers a hassle-free investment to ensure smooth and seamless business management and better living conditions for their human resources. Further, the scheme also tries to empower the challenged sections of the society through its incentive schemes like the Incentive Scheme for employers in the private sector for employing persons with disabilities. As per the scheme, persons with disabilities earning up to Rs. 25,000/- per month are exempted from paying the employer’s share of contribution up to a maximum period of 3 years and the same is reimbursed to the Corporation by the Central Government.

II. REVIEW OF LITERATURE

Importance of Health Insurance: In the modern world, health is just not an individual concept. It is indeed true to say "Health is wealth". *(Pritchett and Summers 1996)* A widely acknowledged definition by WHO states, "Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease" *(WHO 2020)*. It is equally true for a nation as much as it is true for every person living in the country. Therefore, the healthcare of its people becomes an important responsibility of the state to ensure the wellbeing of the state itself. As per Insurance Institute of India, healthcare is set of services provided by various medical and non-medical groups and organizations including the government, to promote, maintain, monitor, or restore the health of people. The state should ensure that healthcare provided to people must be affordable, appropriate, available, adequate, and ample to address all their needs. *(INSURANCE INSTITUTE OF INDIA 2015)*

The healthcare ESI Scheme is the first the health insurance scheme launched in the country by the Government of India under the ESI Act, 1948 to protect the workers from the out of pocket (OOP) expenses resulting from unexpected illnesses and consequent loss of income. Better health insurance is regarded as a critical element of any nation's objective of reducing poverty *(Forgia and Nagpal 2012)* Unforeseen expenditure forces the middle and poor classes of the society to borrow money from organized or unorganized finance providers. Such health-related debt has pushed many low and middle-income households into poverty. A survey report depicts that it has been estimated that around 3 to 4 crores of Indians were pushed into poverty yearly due to the OOP expenses resulting from unexpected medical conditions in their respective households. *(Ahlin, Nichter, and Pillai 2016; Nandi, Ashok, and Laxminarayan 2013)*

Another most important factor that health insurance takes care of is that it ensures the savings of the poor and middle class are invested in the development of individual life both academically and economically rather than being spent for health-related expenditure. A study of generalized findings shows Kerala as one of the most progressive Indian states,

with a higher percentage of people covered against health uncertainties *(Ahlin, Nichter, and Pillai 2016; M and Pillai 2014)* establishing an association between growth of living standards and prevalence of health insurance.

Finally, Population ageing is one of the most prominent demographic concerns in the world today and India is not excluded in the worry. Old age brings its own special and unique problems, but lack of planning concerning health and related expenditure will aggravate the worries. Moderate nuclearization of the joint family, alterations in the value system, deterioration of morality in the economy, responsible for the marginalization of older people in India. As a result, the elderly depends on 'money-order economy' while having contact with their children at distance *(Murugan and Manimekalai 2019)*. This warrants coverage for such people under health insurance schemes.

Social Security and its impact on society: Social Security is a broad expression and as per the International Labour Organization (ILO), it is the security that society provides to its members against certain risks through appropriate systems implemented by the state. *(International Labour Organisation 1996)* The term Social Security was used in 1935 for the first time when the USA approved the National Security Act, to govern and administer the Programme for unemployment, illness, and insurance for old aged people. Since then countries have been thriving hard for the social security of the populace. Health financing thus emerged as a global phenomenon right after war era, when most countries like the USA, Canada, Australia understood the importance of protective work environment and social safety of their employees. *(Mehta 1961)* In order to have a social welfare and conducive atmosphere for employees' in organized sector countries launched different social benefit insurances and schemes that would contribute to better occupational health status. Additionally, through the implementation of the ESI Act, 1948, major legislation was passed in India for the first time to ensure the social security of the workers in the country. Prof. B P Adarkar, who was appointed to draft the health insurance scheme, believed that steps need to be taken to reduce eventuality of illness among workers and the scheme must not be burdened with obligations primarily belonging to other branches of social insurance. He pressed upon the need for parallel schemes addressing unemployment

insurance and old-age pensions, besides such measures as regulation of wages, strict enforcement of factory laws, health, education, and improvement of environmental hygiene. *(Mann 2010)*. Since inception, many committees and study groups have studied the ESI Scheme and proposed timely improvements and changes to the act and scheme. In addition to the providence of better health facilities, the scheme ensures a range of benefits such as cash payment in case of sickness, leave, temporary disablement and permanent disablement, unemployment due to retrenchment and so on. The scheme also addresses pension and health protection for senior citizens after their retirement. The ESI scheme today is one of the largest social security programmes in the world. It is a scheme in which the workers contribute according to their capacity and derive benefits as per their needs. The ESIS functions for the worker in an organized sector throughout the country where it bestows various medical (maternity, sickness, disability), funeral, unemployment benefits. *(ESIC Annual Report 2017)* Several study teams and committees have conducted reviews related to social security scheme, that is, Employees' State Insurance Scheme. It is evident from previous literature that social security system pose as the *sine qua non* of the economic system for any country. *(Garg 2018)* There have been substantial contributions made by authors in the domain of health financing, yet little has been worked upon the ESIS. Although the seeds of ESI scheme were sown way back in 1952 but not much have been studied for coverage and infrastructure of the ESIS. Moreover, it can be understood that the study on coverage would play a vital role to further explore the stumbling block in enactment of the scheme amongst the beneficiaries.

Similar review done for ESIC in 2002 states that opportunity to widen the coverage and implement the scheme country-wide. Till 2002, 679 Centers in around 25 states and union territories. The study discusses the coverage and infrastructure of ESIS in Delhi region. Furthermore, highlights some probable strategy to expand the coverage by creating awareness amongst the employees. *(Gopinath and Krishna 2010)*

Concurrent finding was reported by another study conducted in Tamil Nadu where utilization rate of services was assessed and its effect on catastrophic expenditure in country like India. This was done by primary data collection using a structured questionnaire and results could draw an inference which was not supposed to be in favor of ESIS. *(Dash and Muraleedharan 2011)*

A study conducted among employees enrolled under ESIS from Rohtak, Haryana brought the issue of accessibility and awareness regarding the services. The study depicted the association between utilization of health facilities with literacy status and place of residence of the participant. This also brought the timing of Out-patient department (OPD) facility into notice which was another reason for underutilization of health services. *(Verma et al. 2012)*

According to a descriptive study on ESIC besides mentioning the status of ESIS and benefits availed by the workers, the obstacles in the application of the scheme were highlighted. Under the broad umbrella of security scheme, the largest medical infrastructure for employees of the organized sector is witnessed. The scheme has been articulated well however issues lies in management because of dichotomous nature. Major drawback lies with information system management and accessibility of services. *(K Jayaprakash, HG, and R 2016)*

A cross-sectional study conducted to understand the functioning of ESIS in Kolkata in 2017 stated that maximum insured people were not satisfied with the services provided by ESIC. The facilities are inadequately equipped and lacks medical staff to cater them. Based on the study findings it was recommended to increase awareness about the scheme, improve the quality of services at the centre, simplify the process to claim insurance which will further enhance the efficiency of ESIS. *(Mitra 2017)*

Rationale of the study: ESIS holds importance in the Indian context. Hence a plethora of research and studies have been done regarding the awareness, utilisation, and satisfaction level of the workers towards the scheme. The previous literature shows ample of studies for state specific issues and gaps. However, less data is documented about coverage and infrastructure of ESIS country wide. Therefore, to fill this existing gap in literature we conducted a descriptive study to assess the coverage and infrastructure of ESIS.

The study will assess coverage and infrastructure of the Employees' State Insurance Scheme based on the following indicators. The data for these indicators has been taken

from the annual reports of ESIC from year 2000 to 2018. This will further help to explore and bridge the gap in the literature regarding coverage and infrastructure of ESIS.

III. OBJECTIVES OF THE STUDY

- ***Broad objective***

The objective of the study is to assess the coverage and infrastructure under the ESI corporation over the year 2000 till 2018 and interpret the trend and patterns wherein the corporation is lacking to implement effective and efficient ways to provide social security to the labor class.

- ***Specific Objective***

- To assess the extent and dimension of coverage and infrastructure under ESIC over a time period of 2000-2018
- To assess the gaps in coverage and infrastructure under ESIS
- To advise recommendations for scaling up the ESIS to provide social security thereby reduction in OOP expenditure.

IV. METHODOLOGY

The present study was designed to assess the ESIS in India. ESI Annual Reports have been used to understand the extent of coverage and facilities provided under the scheme.

Study design: Descriptive study

***Time period*:** The study covers a period of eighteen years from 2000 to 2018

***Data analysis*:** The extracted data has been depicted with the help of various tables and graphs

Source of data: ESIC Annual Reports from 2000 to 2018 to analyze the trend and factors affecting the coverage and infrastructure of ESIS

Indicators used to assess the coverage and infrastructure are as follows:

Coverage

- No. of State/Union Territories (UTs)
- No. of Implemented Centers.
- No. of Employers (factories and establishments registered).
- No. of Employees covered.
- No. of Insured Person and Family Units.
- Total no. of Beneficiaries.
- No. of Insured Women.
- No. of Inspection and Surveys conducted.

Infrastructure

- Inspection offices.
- ESI Annexes, Hospitals, and Dispensaries.
- Total no. of beds in hospital (overall and state-wise).
- Insurance Medical Practitioner (IMPs).
- Insurance Medical Officer (IMOs).
- The Ratio of hospitals to employees registered, no. of beds commissioned.
- Indian System of Medicine (ISM)/AYUSH facilities.

V. RESULTS

Coverage refers to the amount, extent, and scope to which the ESI Act, 1948 deals or applies across the nation. Assessing the coverage acts as the initial step towards evaluating the progress of the Act. It further describes and measures the accessibility as well as the

availability of the services provided by the ESI Act to the effective working population.

Table 1: Coverage under ESIS from year 2000-2018

Indicators depicting Coverage of ESIS from 2000-2018

Year	State /UTs covered	No. of Implementing Centers*	No. of Employers registered	No. of Employees covered	No. of Insured Person/ Family Units	No. of Insured Women	Total No. of Beneficiaries
2000-01	25	677	238486	7159350	8493500	1464000	32954800
2001-02	25	678	248213	7000350	8003800	1405350	31054750
2002-03	25	687	253929	7082000	7828150	1430650	30373200
2003-04	25	689	263650	7570200	7912000	1347550	30701000
2004-05	25	718	280871	8400526	8498250	1543250	32973200
2005-06	27	728	305294	9238530	9148605	1622300	35496600
2006-07	27	737	331744	11180866	10157573	1797657	39411383
2007-08	28	773	352508	12569295	12070500	2029440	46833540
2008-09	29	783	394332	12569295	12937577	2264076	50197799
2009-10	29	783	394332	16348908	12937577	2264076	50197799
2010-11	29	790	443010	16504500	15530049	2488576	60256590
2011-12	29	807	580028	17412130	17100958	2407302	66351717
2012-13	30	810	666161	17954970	18582000	2679552	72098160
2013-14	31	815	669880	18921250	19547620	2922345	75844766
2014-15	31	830	723756	29321060	20343800	3360697	78933944
2015-16	33	843	783786	31118680	21361880	3786827	82884094
2016-17	33	843	898138	7159350	31962910	4089773	124016091
2017-18	34	843	1033730	7000350	34331300	4542029	133205444

***Implementing Centers:** All administrative units (pay, branch, inspection offices) are covered

Figure 1: Graphical representation showing States/UTs covered under ESIS from 2000-2018

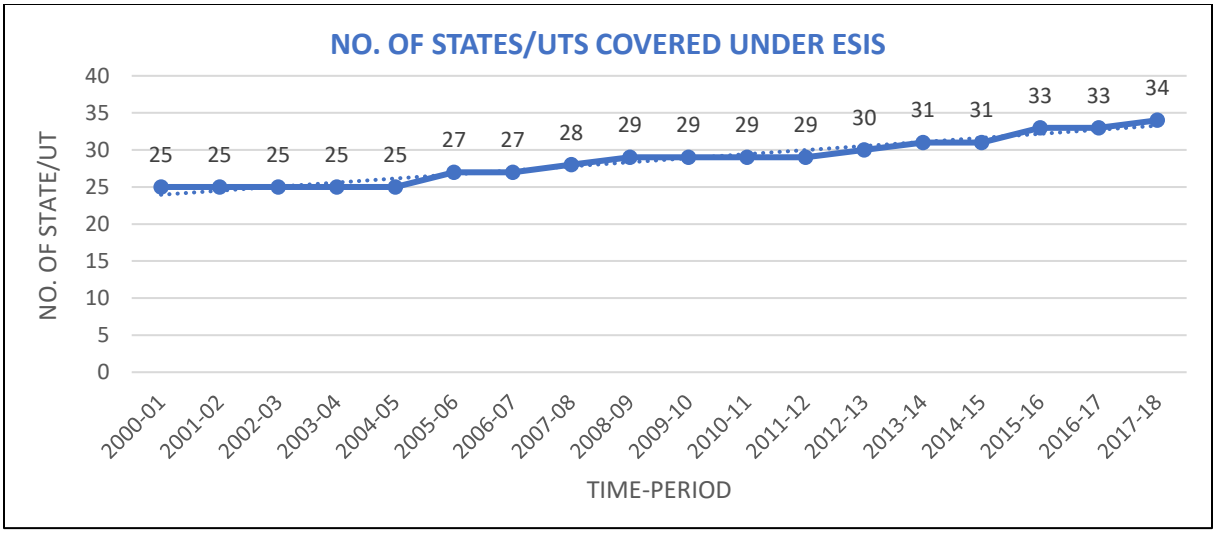


Figure 1 depicts the increasing trend in the implementation of states/UTs under ESIS from 2000 onwards. The scheme was implemented area-wise in phases throughout the past years. In the year 2000, 25 states/UTs were covered under ESIS however, with years states/UTs were added under the umbrella of ESIS and totaled up to 34.

Figure 2: Graphical representation showing Implemented Centers under ESIS from 2000-2018

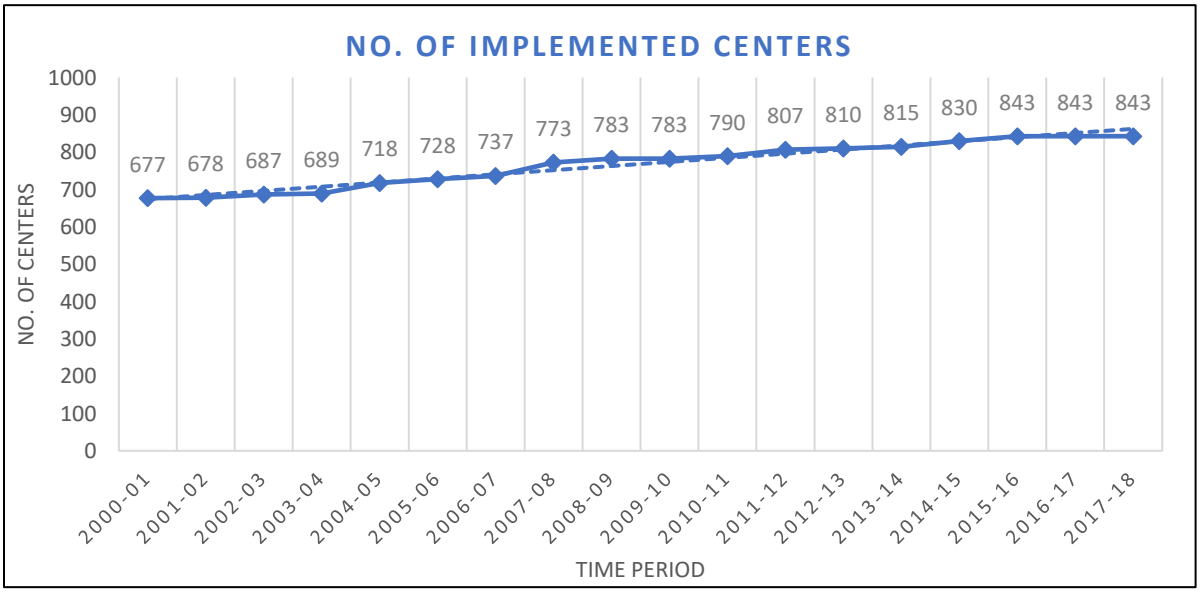


Figure 2 shows the implementation of ESIS across 843 Centers. 166 new Centers have been added from 2000 till 2018. The Scheme was extended to the remaining North-East States, Arunachal Pradesh, Mizoram, Manipur, and also in Andaman & Nicobar Islands in 2014 onwards. It was implemented in Mizoram in 2015 and Port Blair in 2016.

ESIC 2.0 was also launched with effect from 2015 to expand the coverage and implement the scheme in remaining other districts.

Figure 3: Graphical representation showing Employers registered under ESIS from 2000

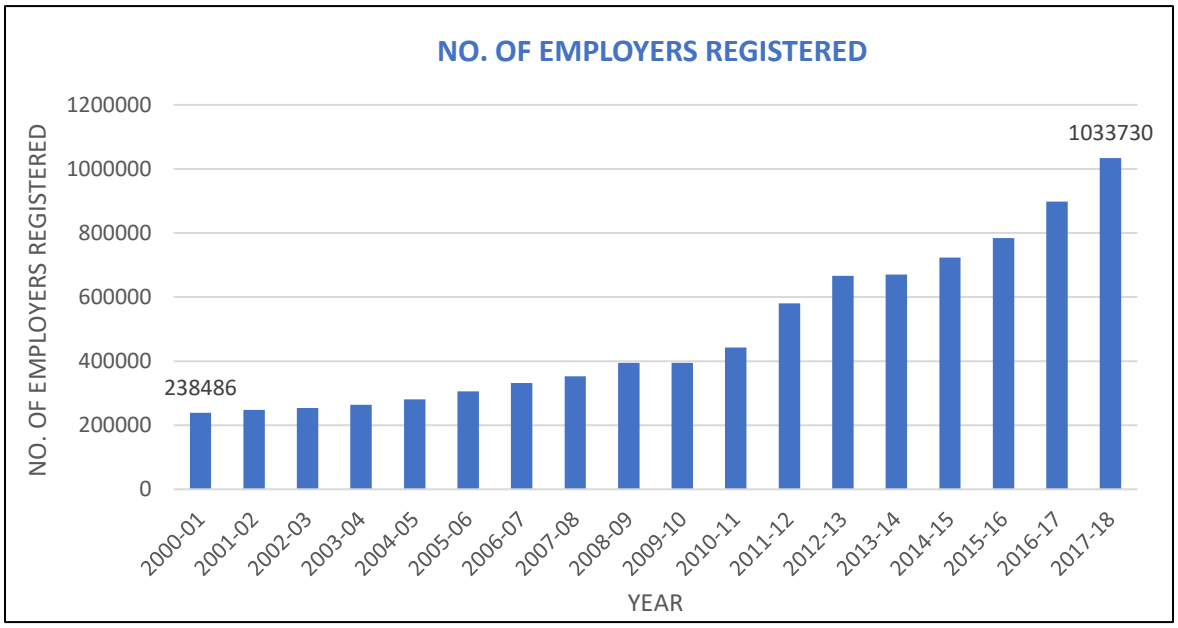


Figure 3 depicts the employers i.e. factories and establishments registered under the ESIS from the year 2000 onwards till 2018. Employers form an intrinsic part of the corporation which forms the basis for the enactment of the scheme. To bring a greater number of employers under the ambit of social security 2.38 lakh in 2000 the number of registered employers escalated to 10.33 lakhs as of 2018.

Figure 4: Graphical representation showing Employees covered under ESIS from 2000-2018

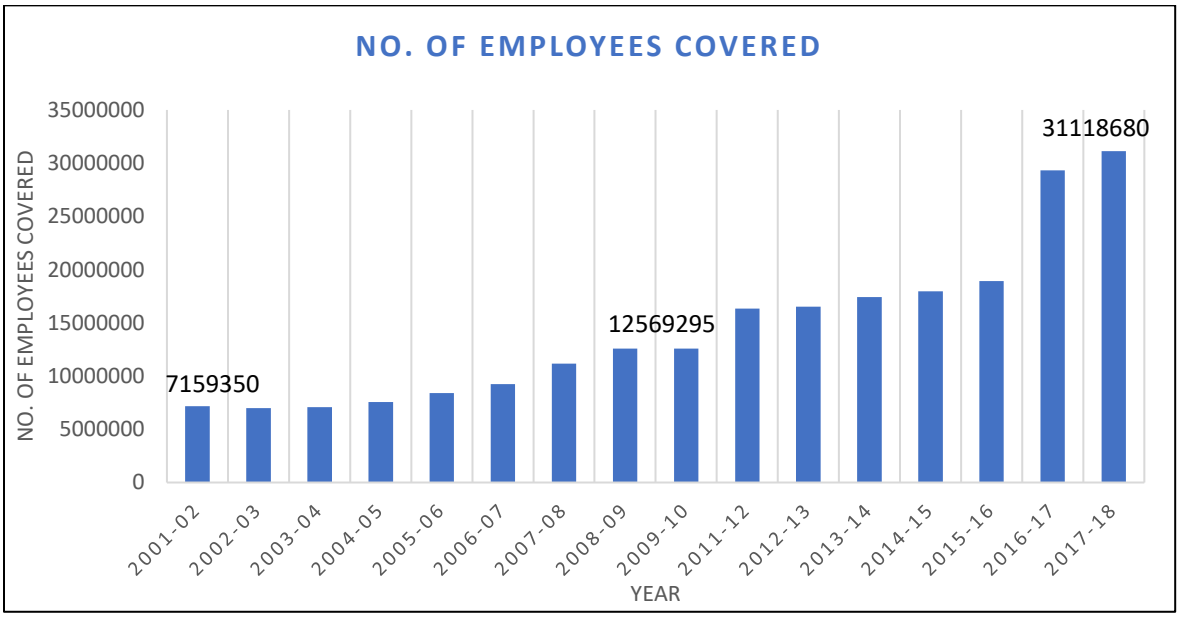


Figure 4 depicts that the scheme was extended to construction workers from 2015 onwards which also contributes to the rise in no. of employees covered to avail the benefit. The ESI corporation witnessed rampant growth in terms of registration of not only employers but also employees. The pilot scheme enforced in 2016 brought self-employed workers like domestic workers and auto-rickshaw drivers from Hyderabad and New Delhi down the umbrella of ESIS. 3.11 crore employees who would be entailed to the scheme as of 2018 report. The number of employers and employees covered under the Act gives us the insights on the acceptability of the scheme among the working class.

Figure 5: Graphical Representation depicting no. of employers and employees in implemented Centers from 2008-2018

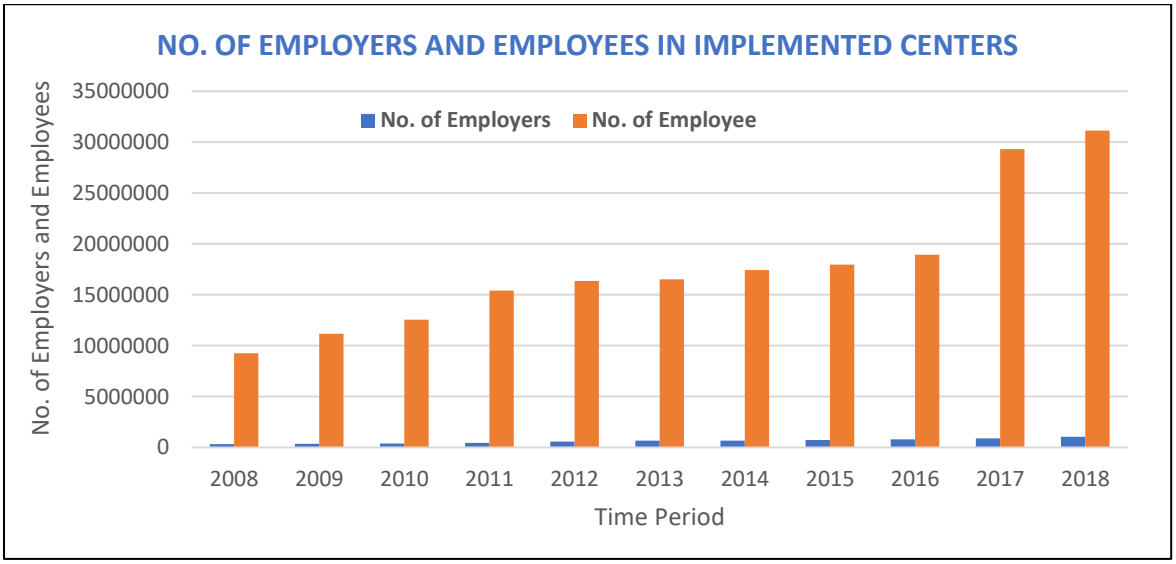


Figure 5 shows that over the time analyzed, the coverage of ESIS has surely expanded to implemented and non-implemented areas as well. From 2008 to 2018 the number of employers and employees sheltered under ESIS increased tremendously.

In the implementation of ESIS, the maximum rise seemed between the year 2011-12 with an increase of 31% of the number of employers whereas the number of employees increased maximum in the year 2016-17 with 55%**.** Understanding the data of implementation Centers spread across the nation, Tamil Nadu showed the maximum

percentage of 12% in the number of employees and employers altogether of the total numbers combined. Chennai backing up the largest 7% of the total number of employees and employers in the implemented Centers across all the cities of the nation. Among the Union territories, Delhi being the headquarters and the national capital also, hold the largest coverage under ESIS. In the union territories, Pondicherry had a minimal contribution to the national coverage of ESIS with 0.05% whereas Sikkim holds the lowest coverage among states with 0.02%

Figure 6: Graphical representation showing Insured person/Family Units under ESIS from 2000-2018

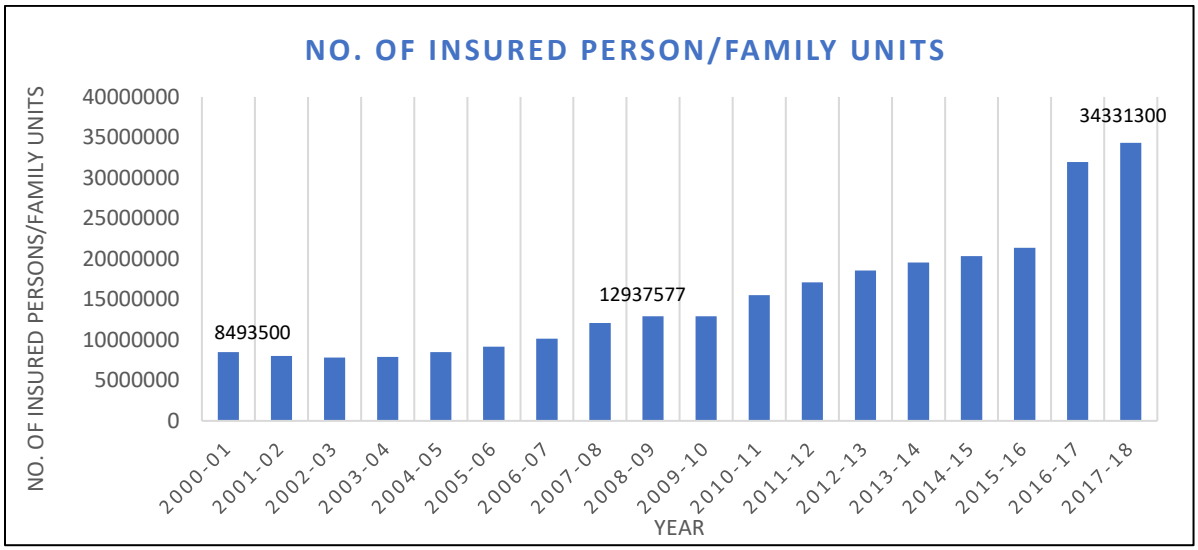


Figure 6 depicts the surge in the number of Insured person/Family units under the scheme which possibly be due to the expansion of the scheme to States/UTs thereby covering all possible geographical regions. Year by year the scheme has advanced and escalated to the whole country and covered workers in the organized sector along with their dependents. At present, ESI benefits have been extended to 3.4 crore dependents as per the 2018 report.

Figure 7: Graphical representation showing Women insured under ESIS from 2000-2018

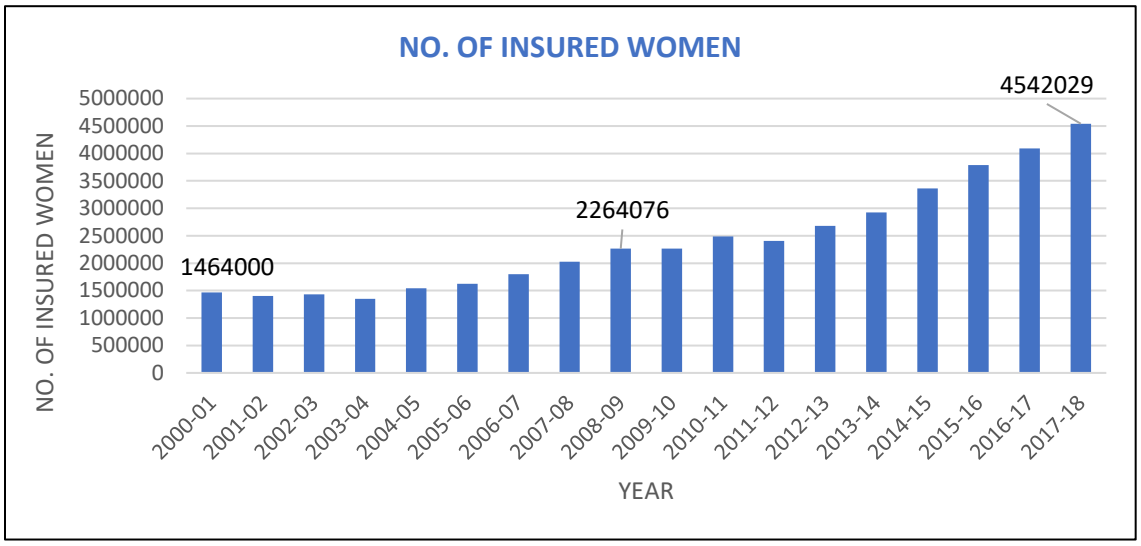


Figure 7 depicts the rise in the proportion of women insured under ESIS. from 14.64 lakhs in 2000, the number of women insured increased to 22.64 lakhs in 2009 and further amplified to 45.42 lakhs in 2018. This upsurge in insured women owes to the contribution of females in the working organized sector.

Figure 8: Graphical representation showing Beneficiaries under ESIS from 2000-2018

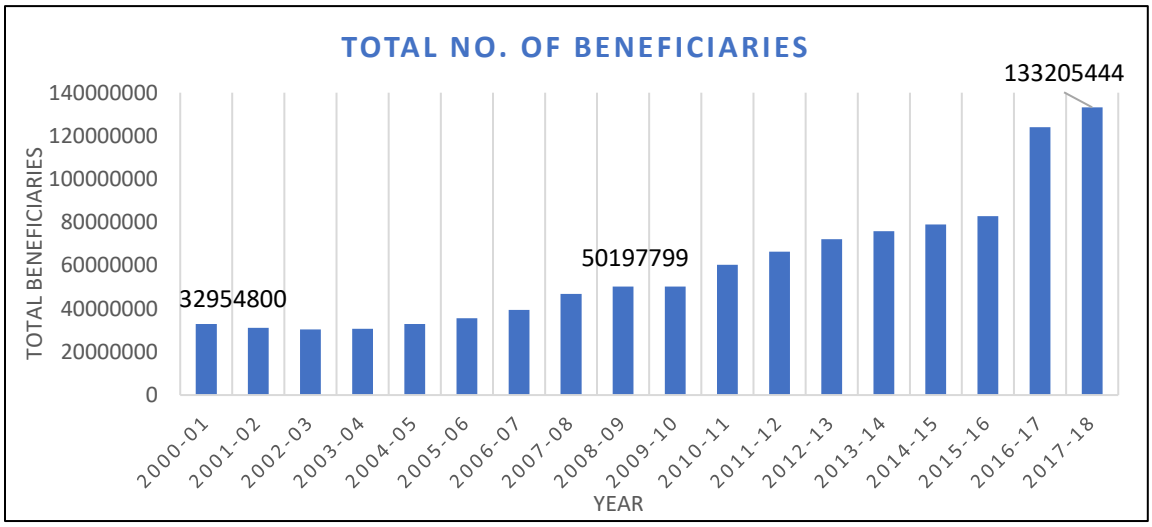


Figure 8 shows the exponential increase in total no. of beneficiaries under the scheme from 2000 to 2018. The proportion of beneficiaries has multiplied by manifolds throughout the past years, however, the surge was notably high from 2016 onwards, when ESIS 2.0 was launched. The coverage of the scheme across the country thus witnessed growth in terms of beneficiaries and benefits availed by them.

The groundwork for assessment can be done by regular monitoring and evaluation. For ESIS, periodic inspection and surveys serve the purpose to estimate the coverage of the scheme. Hence state governments are therefore authorized to assess the benefits availed by workers under ESIS. For efficacious administration of schemes, inspection, and surveys have been undertaken by ESIC officials.

Table 2: No. of Inspection and Surveys conducted under ESIS from 2009-2018

Inspection and Surveys conducted under ESIS from 2009-2018

Year	No. of Inspection conducted	No. of Surveys conducted
2009-10	31771	37861
2010-11	18089	17840
2011-12	25097	29862
2012-13	32254	24906
2013-14	34409	23360
2014-15	26005	28644
2015-16	23450	16252
2016-17	11496	10746
2017-18	15141	3685

In 2010-2011, a special survey drive was initiated in the National Capital Region (NCR) to track the employees under the scheme. Central Analysis and Intelligence Unit (CAIU) was set-up as a part of inspection offices in 2014. Furthermore, in 2017-18, the “Sharam

Suvidha" web-portal was launched to regulate inspections via a computerized system. It can be inferred from Table 2 that the number of inspection and surveys have reduced year by year. Inspections and surveys have been reduced by 97.9% and 89.7% respectively from 2009-10 to 2017-18. The reduction in inspection and surveys was observed due to the non-availability of survey officers as stated by ESIC in the 2014 report.

Infrastructure: Infrastructure includes implemented Centers under ESIS. These Centers covers the administrative building, inspection offices, pay and branch offices, annexes, hospitals, and dispensaries to cater to the need of beneficiaries. Infrastructure is holding a major part in providing essential care and further helps in assessing the accessibility by the beneficiaries.

Table 3: Infrastructure of ESIS from year 2000-2018

Indicators depicting Infrastructure of ESIS from 2000-2018

Year	No. of Inspection offices	No. of Annexes*	No. of Hospitals	No. of Dispensaries	Insurance Medical Officers (IMOs)	Insurance Medical Practitioners (IMPs)
2000-01	219	43	140	1453	6222	2950
2001-02	211	43	141	1451	6240	2789
2002-03	215	43	142	1447	6812	2651
2003-04	224	43	143	1452	7171	2511
2004-05	235	42	144	1427	6960	2135
2005-06	248	42	144	1422	6992	2041
2006-07	265	42	144	1388	6890	1942
2007-08	346	42	144	1397	7099	1753
2008-09	352	42	148	1398	7070	1678
2009-10	352	42	148	1398	7070	1678
2010-11	374	42	146	1403	7455	1447

2011-12	383	42	150	1372	7340	1380
2012-13	406	42	151	1384	7958	1224
2013-14	422	42	151	1418	7763	1017
2014-15	428	42	151	1459	7874	954
2015-16	360	42	151	1467	7898	948
2016-17	401	42	151	1489	7828	950
2017-18	341	42	154	1500	7908	980

***Annexes:** Hospital having less than 50 beds

Figure 9: Graphical representation showing Annexes, Hospitals and Dispensaries under ESIS from 2000-2018

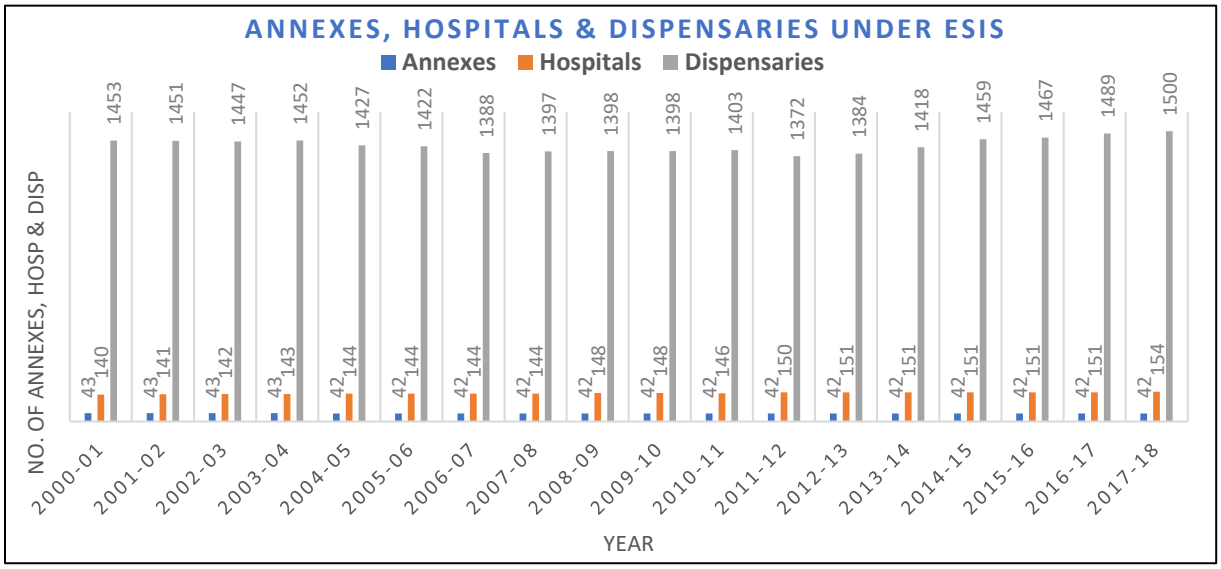


Figure 9 illustrates that the number of annexes has remained the same however hospitals and dispensaries have increased gradually every year. ESIS focuses on providing primary care to the workers therefore there has been a moderate rise in the number of dispensaries from the year 2000.

Figure 10: Bar graph showing IMOs and IMPs available under ESIS from 2000-2

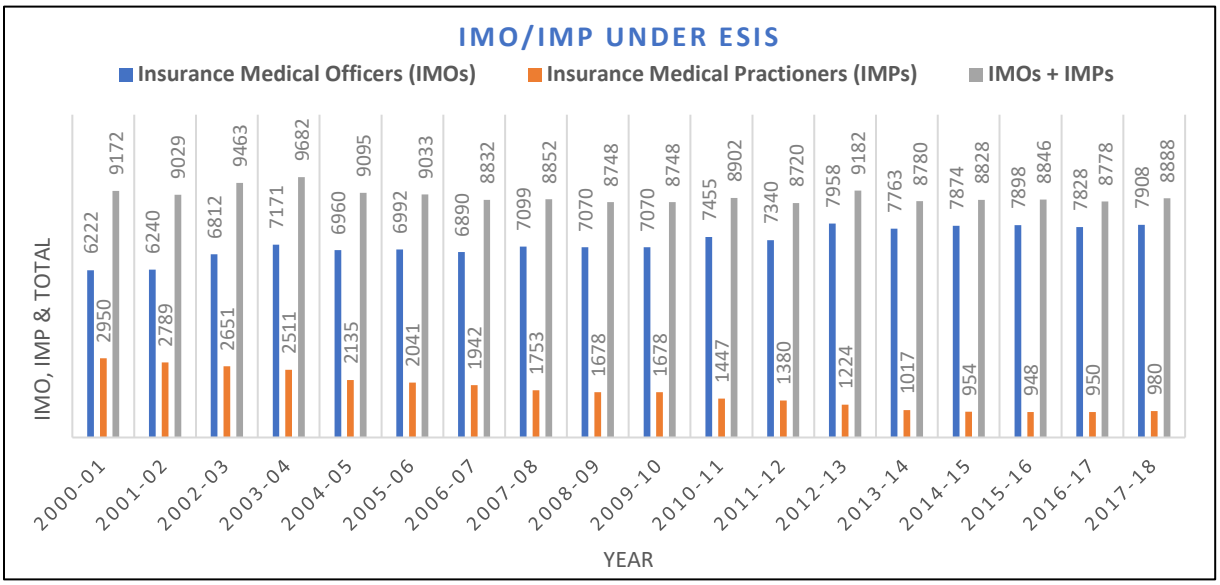
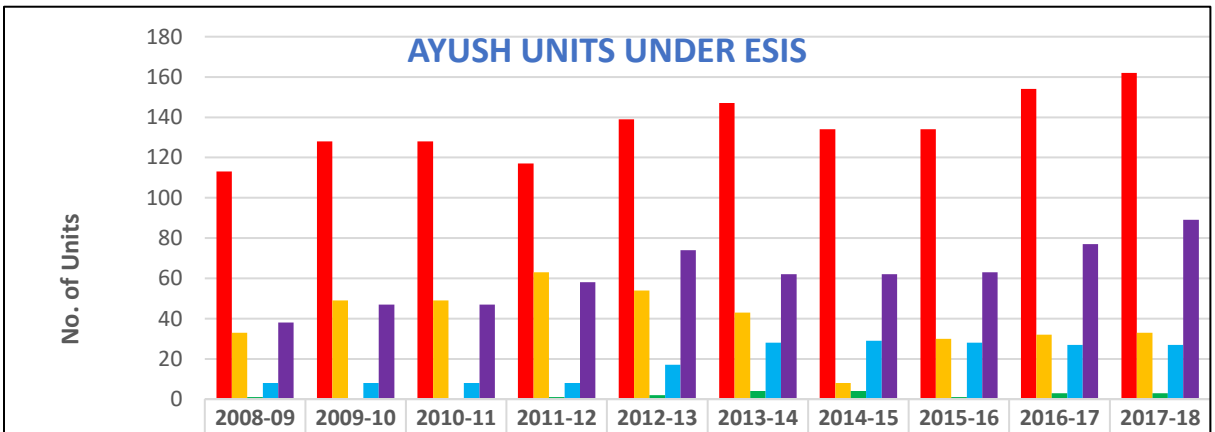


Figure 10 illustrates that the number of Insurance Medical Officers has increased steadily but Insurance Medical Practitioners have decreased in these years. This reduction in IMPs has been observed due to vacant positions in ESIC from the information available in the public domain.

Figure 11: AYUSH units covered under ESIS from 2008-2018



	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Ayurvedic	113	128	128	117	139	147	134	134	154	162
Yoga	33	49	49	63	54	43	8	30	32	33
Unani	1	0	0	1	2	4	4	1	3	3
Siddha	8	8	8	8	17	28	29	28	27	27
Homeopathic	38	47	47	58	74	62	62	63	77	89

Figure 11 depicts that AYUSH units have successfully incorporated under the ESIS, but the number of units remains uneven throughout the years. There has been a sharp rise in the number of Siddha and Homeopathic units whereas the number of Yoga units remains constant from 2000 to 2018. All this has been possible due to the launch of ESIC 2.0 where the promotion of the Indian system of medicine plays a vital role.

Figure 12: Total beds commissioned across country under ESIS from 2000-2018

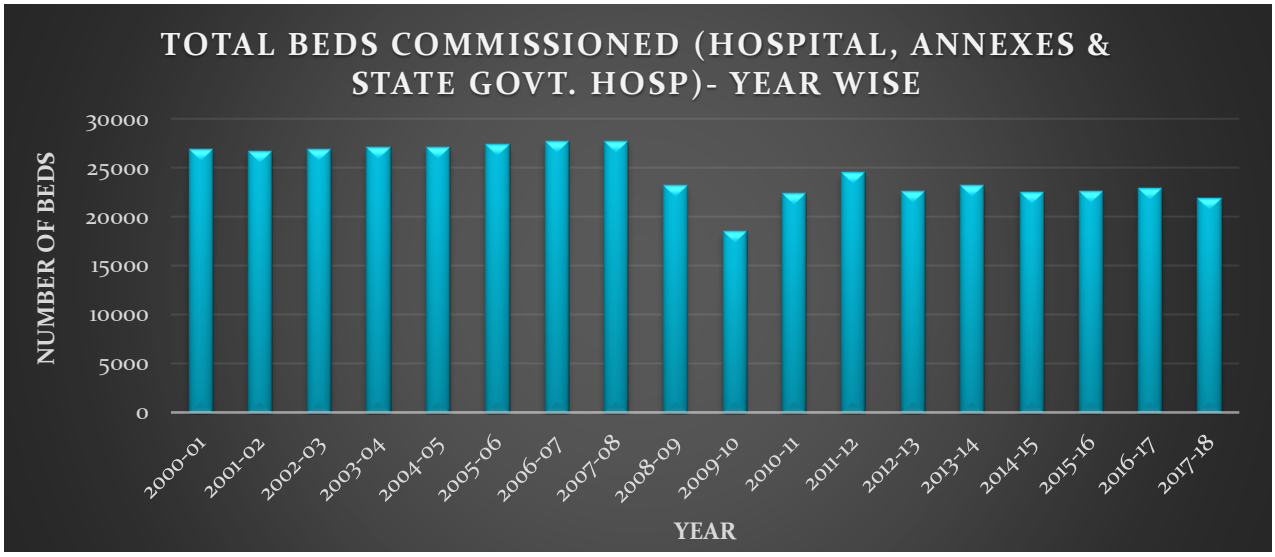
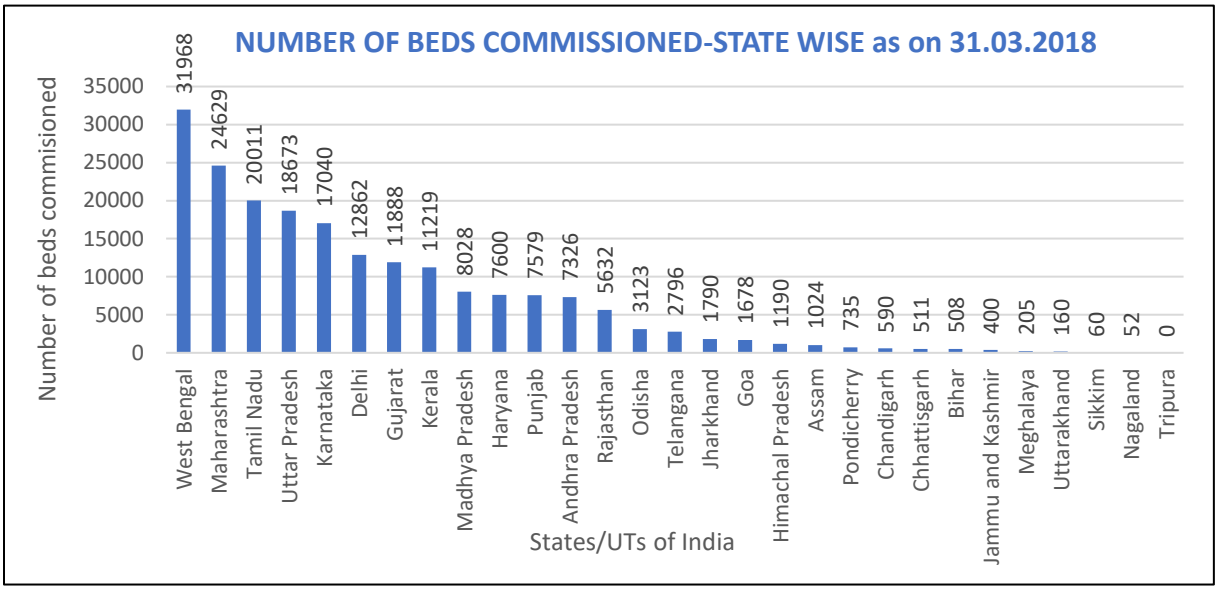


Figure 12 depicts that the total number of beds includes beds reserved in ESI hospitals, annexes, and state government hospitals impaneled under the ESI. There has been an abrupt depression in the beds for the year 2009-10. Few newly implemented Centers (for example; Sikkim, Nagaland, Tripura) have reported a shortage of beds in ESI hospitals for beneficiaries.

Figure 13: Total number of beds commissioned state-wise as on 31.03.2018



VI. DISCUSSION AND CONCLUSION

Summary of key findings:

- The ESIS has been extended up to 34 States/UTs including north-eastern states with 843 implementing Centers as on 2018.
- The scheme has been extended to 10.33 lakhs employers (factories and establishments registered) and 3.11crore employees. With the number of employees, the family units also increase to 3.43 crore as of 2018 reports.
- Total beneficiaries are as high as 13.32 crore.
- Inspection and surveys have reduced to 15141 and 3685 in 2018 which were reported as 31771 and 37861 respectively in 2000.
- The total number of beds commissioned has also decreased over the years. There comes a deficiency of beds for the employees and their families. It seems that ESIS focuses on providing primary care to the beneficiaries rather than secondary or tertiary care for the reason that the referral system remains doubtful for the majority.

- There is a huge disparity between the number of employees registered and beds commissioned for them.
- Promotion of AYUSH along with ISM has led to their construction and establishment of AYUSH units under ESIS. However, the services are underused owing to many other factors.

All the above-mentioned findings throw light on the organization and implementation of the scheme among the workers. These gaps should be identified and mustered upon for the successful implementation of the ESIS. ESIS has been instrumental in paving way for public and private sector employers and employees to hold a firm belief in social security and wellbeing.

Nevertheless, India's panorama for healthcare financing has undergone monumental changes in the past two decades with the initiation of many health insurances and social security schemes across the country. Surprisingly, to observe these remarkable changes in the geometry of health insurance coverage throughout the country. The country has been flooded with a plethora of insurance schemes majorly for the organized sector, such as Central Government Health Scheme (CGHS), ESIS, and for in unorganized private health insurance comes into play. The breadth, depth, and height of ESIS coverage have observed a gigantic jump during 2000-2018.

The breadth of the coverage can be understood by the percentage of beneficiaries covered under ESIS has increased from about 7.15 million employees (roughly about 33 million family beneficiaries) in 2000-01, to around 31 million employees (134.3 million family beneficiaries) in 2017-18 which is around one-fourth of the total populace of the country. The breadth of the coverage of the scheme is spectacular and witnessed increment by leaps and bounds from 2016 onwards.

The depth of the coverage could be relatable to the extent of benefit packages offered in the scheme, thus the benefits package provided here is extensive in comparison with other HI schemes across the country. Yet ESIS covers only formal sector employees which are the biggest drawback in a country where more than 80% contribute to the informal sector jobs. Therefore, the depth of coverage of the scheme could further expand if the mandate is worked upon in terms of the workforce (informal/unorganized) sector.

The length of the coverage indicates the contribution made by the insured person to obtain benefits related to health care costs in form of premium (prepayment) and risk pooling (especially public subsidy of the cost of care). Since the contribution is made by both the employer and employee in ESIS, hence the problem of prepayment and risk pooling, which acts as a foremost step to any health financing outcome, are considered significant here. And thus, there is a component involving prepayment and risk pooling, for which a part of the burden for specialized hospital care for the covered populace is borne by the government. To some extent, catastrophic costs on sickness and the likelihood of going below the poverty line due to hospitalization (inpatient care/surgical care) is reduced.

Conclusion: There are some shortcomings with the ESIS which should be worked upon to improve the functioning of the ESIC. The scheme has been implemented at a larger scale, as it covers a huge number of employers and employees along with their dependents. However, the problem lies with the utilization of the services together with regular monitoring and evaluation. Previous literature supports the fact that services at ESIS remain underutilized due to many reasons which can be amended otherwise. Firstly, the issue of non-availability of the staff in hospitals and dispensaries needs to be fixed for better reach because the number of IMPs has been declining over the years. Secondly, the accessibility of the facility influences the utilization of services by beneficiaries. Thirdly, the amount of paperwork done for the claim process hinders the worker to avail services for which he regularly contributes. Lastly, it is due to the lack of awareness amongst the workers about the benefits they are eligible and contribute from their hard-earned money. It was also observed that inspection and surveys have reduced after the incorporation of CAIU in 2014.

VII. RECOMMENDATIONS

- Ladakh and Tripura, 2 out of the total 36 States and Union Territories, are yet to be covered under the ESIS.

- Inspections and surveys are to be further to be increased, registered and collaborated with proper monitoring, evaluation and functioning of the infrastructure of the scheme. Consequently, further helping in formulating policies and scrutinizing the working of the scheme as well.
- The number of beds and diagnostic facilities should increase proportionately with the number of insured employees and their families to have a balance between the two.
- Expansion of AYUSH amenities through coverage and infrastructure can further develop ESIS.
- The coverage should be extended to informal/unorganized sectors like the agricultural workers, small- and medium- scale businesses too encompassing the disparities like migration.

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ANNEXURE I

Administrative and structural plan of the ESIC

The administrative functions of the ESIC are controlled by various stakeholders such as the Central Government, State Government, Apex Governing Body of the Corporation, Standing Committee, and Medical Benefit Council.

Central Government: Central Government in consultation with the corporation can make rules on all the matters of the Corporation, some of which are:

- Limit of wages and monthly salary to be ensured under the scheme.
- To decide and revise the rate of employee and employer contributions from time to time.
- To decide the appointments and elections of members of the corporation, standing committee, and Medical Benefit Council.
- To be the quorum at meetings of the Corporation, the standing committee, and Medical Benefit Council and to decide the minimum number of meetings of those bodies to be held in a year.
- The powers and duties of Director-General, Financial Commissioner, Medical Benefit Council.

State Government: The role of providing Medical Benefit to the Insured Person is that of State Government, they can also make rules in matters such as:

- The constitution of Employees' Insurance Courts, the qualifications of a person who may be appointed judges thereof.
- The establishment of hospitals, dispensaries, and other institutions.
- The scale of medical benefit which shall be provided at any hospital, clinic, dispensary, or institution.
- The nature, extent, and conditions of the service of the staff employed at hospitals, dispensaries, and institutions.

Apex corporate body is known as Employees' State Insurance Corporation which is responsible for coordinated policymaking and taking decisions for the growth, development, and efficacy of the scheme.

Constitution of Corporation:

- A Chairman (Union Minister of Labor).
- A Vice-Chairman (Secretary to GOI, Ministry of Labor and Employment, GOI).
- Five persons to be appointed by the discretion of the Central Government.
- One person representing each state in which the ESI Act is applicable shall be appointed by the respective state government.
- Ten persons representing employees to be appointed with consultation of their organization.
- Two persons representing the medical profession.
- Two members of Lok Sabha and one member from the Rajya Sabha.

- The Director-General of the corporation, ex officio.

Constitution of the standing committee: A standing committee is also constituted consisting of the existing members of the Corporation, which are elected and appointed by the discretion of the Central Government. The powers of the standing committee include the general superintendence and control of the corporation, it also administers the affairs of the corporation and has full powers to perform any functions of the corporation.

- A Chairman.
- Three members of the corporation.
- Three members of the corporation representing three state governments.
- Eight members to be elected among the members of the corporation.
- Three members representing the employers.
- Three members representing the employees.
- One member representing the medical profession.
- One member from the Parliament.
- The Director-General of the Corporation, ex officio.

Medical Benefit Council: A medical benefit council is constituted under the control of the corporation to advise the Corporation and Standing Committee of matters related to Medical benefit, certification related to grants of benefits. It also has the power to investigate the complaints against medical practitioners in connection with medical treatment and attendance.

Medical Benefit Council shall consist of the following members.

- The Director-General, the ESIC, ex-officio as Chairman.

- The Director-General, Health Services, ex-officio as Co-Chairman.
- The Medical Commissioner of the Corporation, ex-officio.
- One member each representing each of the States in which the ESI Act is in force.
- Three members representing the employers.
- Three members representing the employees.
- Three members, of whom not less than one shall be a woman, representing the medical profession.

ANNEXURE II

ESIC 2.0

Shri Narendra Modi, Hon'ble Prime Minister launched a series of Health Reforms Initiatives for ESIC, newly known as ESIC 2.O at Vigyan Bhawan, New Delhi on 20.07.2015.

Health Reforms Agenda of ESIC includes:

- Online availability of Electronic Health Record of ESI Beneficiaries under the Project 'Panchdeep', which will include laboratory reports in digital form as it will eliminate the need of visiting the hospital for the same.
- Abhiyan Indra Dhanush: This Abhiyan was launched to emphasizes hygiene and cleanliness, thereby instructing hospitals to change their bedsheets in VIBGYOR pattern and further to work on greenery around the premises.
- Medical Helpline with No. 1800 11 3839 has been set up for emergency and seeking guidance from casualty/emergency of ESIC Hospitals.
- Special OPD for Senior citizens and differently-abled persons in ESIC hospital.

- Expansion of ESIC coverage to all States/UTs. - Accordingly, ESIS has been stretched to Arunachal Pradesh, Andaman & Nicobar Island,and Mizoram.
- Telemedicine – Pilot run of telemedicine in the State of Bihar, U.P., and Uttarakhand.
- Tracing of every pregnant mother & newborn to ensure 100% Immunization as well as full-term normal delivery.

Part 2- REPORT ON ONLINE COURSE

- ***INTRODUCTION TO SYSTEMATIC REVIEW AND META-ANALYSIS***

Online Course by

John Hopkins University at Coursera

COURSE DESCRIPTION

With the advancement of the Pandemic across the globe, novel ideas to combat the problem of stagnancy in the education system. The online course came to the rescue of students as a tool to imbibe knowledge and develop skills for further advancement in the individual fields. Coursera is a public database providing new and updated courses across the web

globally. It has been enhancing and delivering information across a wide range of instructive modalities.

The course on “Introduction to Systematic Review and Meta-analysis” requires six weeks of commitment with four-six hours per week. It presents and familiarizes with the methods of systematic reviews and meta-analysis of randomized clinical trials. This course helps in the formulation of an accountable research question, describe exclusion and inclusion measures, the examination of the evidence, excerpt data, evaluate the menace of bias in randomized clinical trials and complete a meta-analysis. The course is English with the availability of subtitles.

The course is provided by John Hopkins University, who are premiers in the field of research and analysis in healthcare. The sheer clarity and impeccable delivery of information, John Hopkins University capitalizes and advance in educating public health influencers across the planet, beyond the campus walls. The audit course provides knowledge freely and amenably to dedicated learners and students in the ever-expanding section of online courses.

Levels of Evidence

A shareable certificate with some amount is also provided by the online platform of Coursera. Saving time, open scheduling, students' choice, and flexibility in study hours are altogether increasing the effectiveness of virtual learning. The course was further divided in a span of 6 weeks.

- Week 1

  Introduction to the broad overview of origin and usage of systematic review and meta-analysis.

- Week 2-

  This week deals with the elements, framing, refining, scope of the research question.

- Week 3-

  About the pursuit of evidence, search strategy, assessment of the bias.

- Week 4-

  This module incorporates minimizing different types of biases, it is transparent reporting, and qualitative fusion and interpreting and inferring results.

- Week 5-

  Scheduling of the meta-analysis and the statistical approaches for meta-analysis.

- Week 6-

  Summarizes the key concepts with the submission to Peer Review Assignments.

OBJECTIVES OF THE COURSE

The following objectives are addressed.

- To determine and understand the steps while conducting a systematic review and meta-analysis.

- To gain the ability to critically read literature in systematic review and meta-analysis, in the future.
- To advance the skill to assimilate the outcomes of the systematic review into the future works by answering "Participants Interventions Comparisons Outcomes" (PICO) outline and framework.
- To gain knowledge of better practices doing searches, collecting, and extracting the data for systematic reviews.
- To define means to critically evaluate the menace of "bias of clinical trials "and elaborate on the risk of bias.
- To advance in the field of skill development with introduction and interpretation of metabias and qualitative synthesis.
- To develop and refine clinical question that can be addressed by a systematic review

The basic aims of the course surround the following

- Firstly, learning the phases that encompass a systematic review and meta-analysis.
- Furthermore, it surges the critical capacity to read the literature for the same.
- Lastly, it also expands the ability to assimilate the outcomes of systemic reviews.

COURSE CONTENTS

This Course is wholesome and provides an overall insight with a multidimensional take on the learning modules. The versatility of learning methodology is produced by the balance between inquisitive quizzes, peer-review assignments, along with the informative videos. This remodeled the online learning procedures increasing the involvement of the participants. The engrossing teachings and lectures made the introduction to systematic reviews and meta-analysis, comprehensive and elaborative. Enhancing the delivery system of information, the concise monologue collaborated with assignments and quizzes.

The learning methodology included the following means-

VIDEO LECTURES

The video lectures enhanced the intellect and even severed the analytical aspects of thinking with various improved examples of systematic reviews from the past. The video lectures included the speaker directly addressing the participants or PowerPoint presentations to cater to the more logical and diagrammatic representation of the information. A step by step guidance in creating operative searches on various databases encouraged prospects of carrying out well-organized and competent evidence-based searches. Video elaboration of personal experience of using systematic review gives detailed need to comprehend the basics of the systematic review. All the videos were to be watched entirely to complete the course.

READINGS

Readings in between videos helped in particularizing the way of how a systematic review is to be written. It also maximizes reading skills and diagnostic review patterns of the reader to become a writer for the same. After reading, all the readings were to be marked to complete the course as well.

QUIZZES

Quizzes are an integral part of the course. It regains the attention of the participant in an otherwise monotonous collection of videos and lectures. Graded quizzes help in an easy evaluation of the conception and command of the topics covered. It also increases the gravity and instills discipline while focusing under pressure. Time management is another quality learned while taking part in these quizzes and improving aspects of learning.

The course included seven quizzes with a minimum passing percentage of 70%. While all the quizzes were compulsory for passing, three attempts per eight hours were given to efficaciously complete the course. It was lenient enough to count the most successful attempt, in case of multiple attempts, as the effective marking for the module. All the effective markings for the different modules are aggregated to the total grading system of the course.

PEER REVIEW ASSIGNMENTS

Peer Reviews are a novel type of assignment that is acknowledged during the course. Peer Reviews offers the answers of the participants to be reviewed by other participants taking the same course simultaneously. With two peer-review assignments, the minimum score of 70 percent is needed to pass both the assignments. Apart from the assignments, the participants are responsible for the compulsory evaluation of at least four peer reviews for each assignment. The accomplishment of the above tasks would add to the completion of the course.

FIELD VIDEOS

Short videos are scattered throughout the course containing field interviews of experts sharing their experience about the direction and usage of the systematic review.

GRADING POLICY

The final grade is calculated as follows-

Each quiz = 9 percent of the total grade. (9*7=63%)

Peer Review 1 = 15 percent of the total grade.

Peer Review 2 = 22 percent of the total grade.

COURSE CERTIFICATES

Ongoing through all the videos, reading materials, passing all quizzes and peer-review assignments, a completion certificate is offered after some monetary assistance. Verification of all the task done after the enrollment in the course results in the final certificate acquirement. Financial aid is also available for students with confirmed economic requirements.

KEY LEARNINGS

Upon completion of this course, the following steps became precise and coherent

- Elaboration of steps involved in steering a systematic review.
- Advance in developing an accountable research question employing of the "Participants Interventions Comparisons Outcomes" (PICO) outline.
- Designate the procedure adopted to assemble and excerpt data from the information of clinical trials scientific articles.
- Characterize approaches to censoriously measure the "risk of bias of clinical trials".
- Illustrate and construe the outcomes of meta-analyses.

Divided in six weeks, the learning journey is divided as follows-

"Week 1-Introduction"

5 videos, 3 reading materials.

An extensive and comprehensive overview with the welcome to the course an introduction is made to the instructors and syllabus of the course. The following key learnings are gained under the following headlines.

Welcome to the course

Clearing the set objectives and aims of the course of comprehending the phases, critical evaluation, and integration of results of a systematic review and meta-analysis as well. As further discussion continues, the briefings for the superlative practices for doing searches with the overview of metabias and qualitative amalgamation. A "**pre-course survey**" was also undertaken to understand the need for taking the course

Introduction.

- **Systematic review**

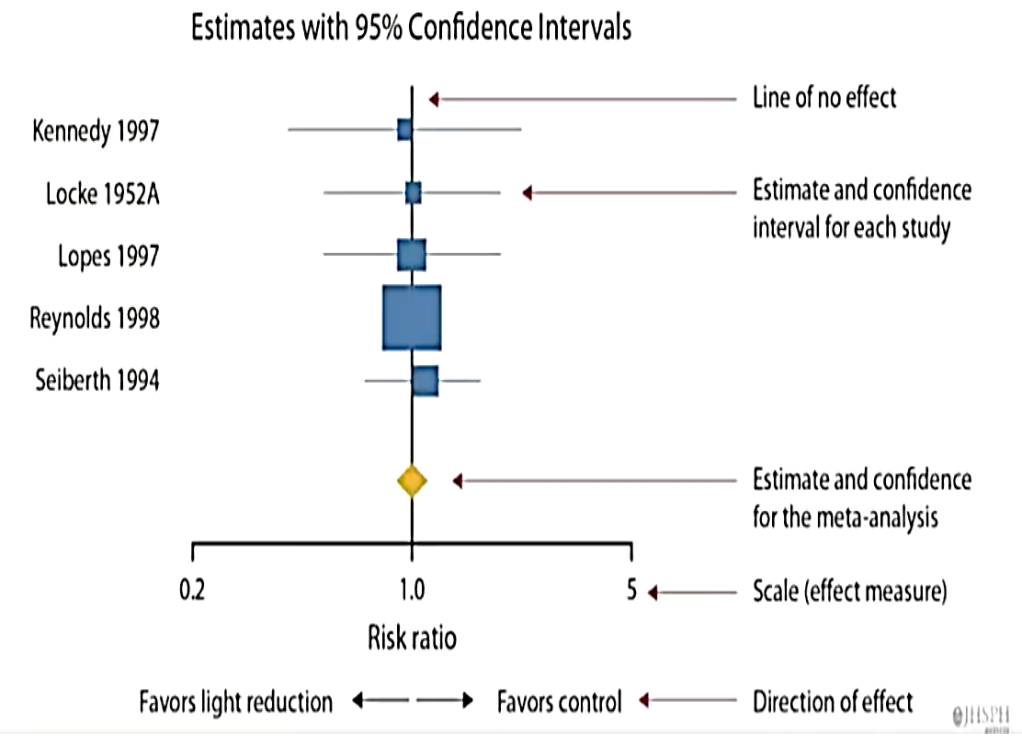
It practices unambiguous, prearranged methods to categorize, select, evaluate, recapitulate, and produce results from comparable but distinct studies. Meta-analysis is the numerical technique of investigating and quantifying a hefty assemblage of results from discrete studies. The systematic review is done by autonomous authors, the Cochrane library alliance, policymakers, and businesses.

- Characteristically, Systematic Reviews simplify the resourceful combination of information for normal decision making. It delivers a vibrant and crystal-clear procedure and determines consistency and variance of the effects of healthcare. It also diminishes bias and lessen chance effects and can be voluntarily reorganized. It permits decisions based on evidence while it also offers more accurate estimations.
- Transparent, "evidence-based" healthcare results in dependable answers to significant, specific research questions with the incorporation of the finest research evidence with scientific proficiency and patient worth.
- Create the research team with professionals in methodology, frame the research question, synthesize the findings, construe, and assess the body of evidence, minimalize bias, and conflicts of interests.
- Develop a procedure for assembling data, discovering studies, broadcasting of the results immaterial the data and evaluate the risk of bias
- The systematic review can be updated after publishing and evidence-based healthcare is now called Comparative Effectiveness Research.

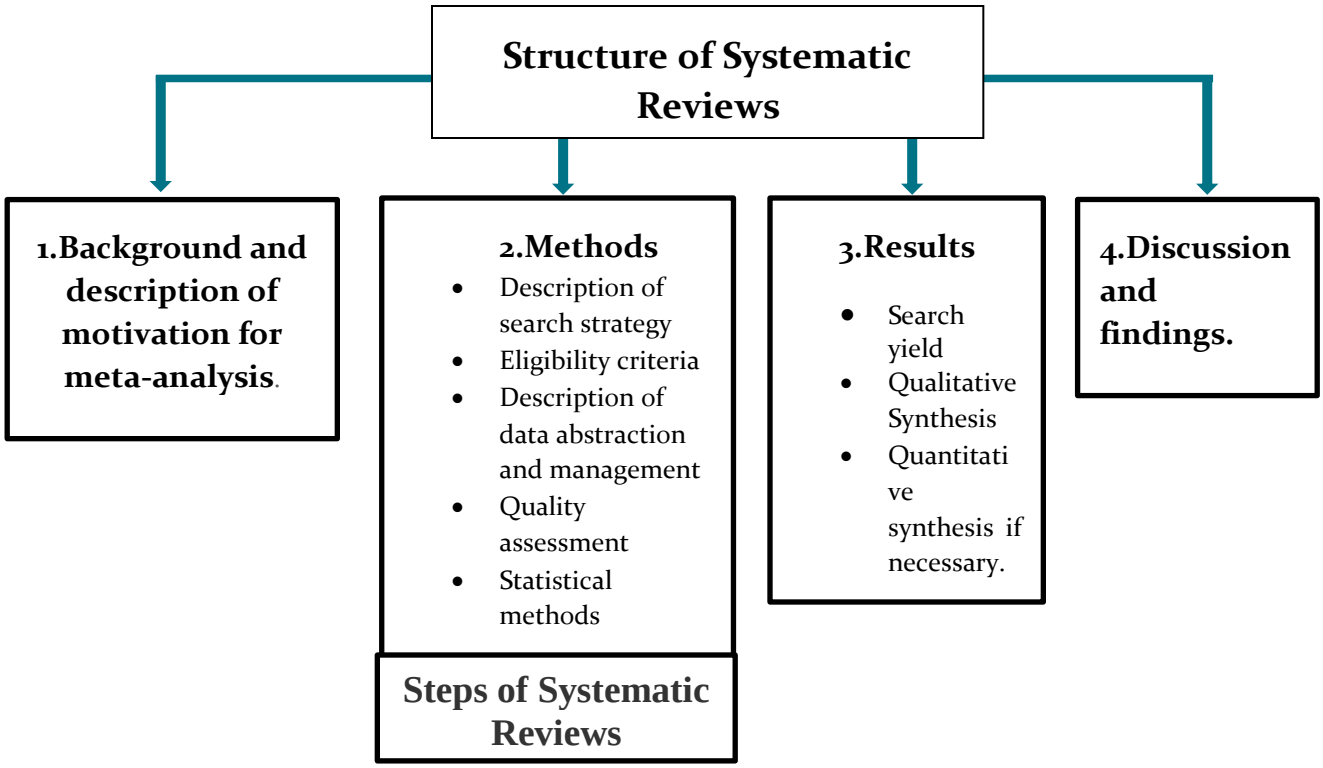
- **Meta-analysis**

Meta-analysis is defined as a statistical analysis that combines the results of several independent studies considered by the analyst to be combinable.

  - Meta-analysis is represented by a forest plot.



- A meta-analysis helps as it measures strong points of evidence-to regulate the direction of the existence of an effect. It syndicates result quantitatively-to attain a solitary summarized result. It explores heterogeneity- to scrutinize motives for different consequences of studies. It validates combining results- for common effect studies or the same research question.
- Meta-analysis is done when-
    i. Two or more studies estimate an association
    ii. Specific differences are investigated.
    iii. Reporting of similar treatment effects.



Steps of Systematic Reviews

- **Frame research question (PICO/PECO)**
- Develop search strategy
- Develop protocol
- Run search strategy in at least two databases
- Retrieve and de-duplicate citations
- Develop system for screening titles/abstracts and full-texts
- Screen titles/abstracts
- Retrieve and screen full-texts
- Develop forms for assessing 'risk of bias' and extracting data
- Assess 'risk of bias' and extract data
- Clean and manage data
- Conduct qualitative synthesis
- Conduct meta-analyses (if appropriate)
- Write report of systematic review
- Update systematic review

"Week 2-Framing the research question"

7 videos, 1 reading,1 peer review assignment,1 quiz

This module deliberates the framing, opportunity, fundamentals, enhancement of the research question.

Resources for framing the question.

- Formulate the topic-
    - Approve the requirement for a novel and innovative research topic.
    - Develop an investigative outline.
    - Use standardized format to cohere components of the question (PICO-TS)
    - Describe a validation for each element of the question.
    - Enhance each element of the question.

Decide the kind and scope of the research question.

- It is always better to have an ambiguous, estimated answer to an apt, accurate question, instead of an exact, precise answer to an incorrect question.
- Similar studies may vary based on-
    - Target or control population.
    - Inclusion and exclusion measures.
    - Interventions or exposure.
    - Administration decorum.
    - Analysis and outcome definitions.
    - Quality of strategy and implementation.
- Narrow questions are selectively applicable and can result in biased conclusions, while broad questions are time-consuming, difficult to sustain, synthesize, and infer.
- Components of the question
- Stages in the Evidence-based Healthcare
    - Set and categorize the appropriate question.
    - Search for the best possible evidence.
    - Acutely consider the evidence.
    - Administer the evidence.
- A well-articulated research question regulates the norms for selection of studies, expansion of the exploration approach, and statistics to be withdrawn.

Elements of an answerable question include

- P-Population with disorders, conditions or area of interest
- I-Intervention/exposure with a time interval, dosage concentration or course of administration
- C-Comparison or control group
- O-Outcome defining criteria
- T-Timing or duration
- S-Setting

Refinement of the question.

- The outcome has the following essentials-
    - Realm of interest.
    - Detailed quantities.
    - Detailed metrics
    - Methods of "aggregation"
    - Timepoints

Analytic Framework

It is the logical model that defines and associates the clinical ideas, evidence, and populaces with the outcome.

It is adopted because it-

- Simplifies implied assumptions.
- Recognizes rational defects in the question.
- Recognizes diverse pieces of evidence to be involved in the research.
- Reports several questions in the review.
- Summaries a multifaceted logic between transitional and experimental conclusions.

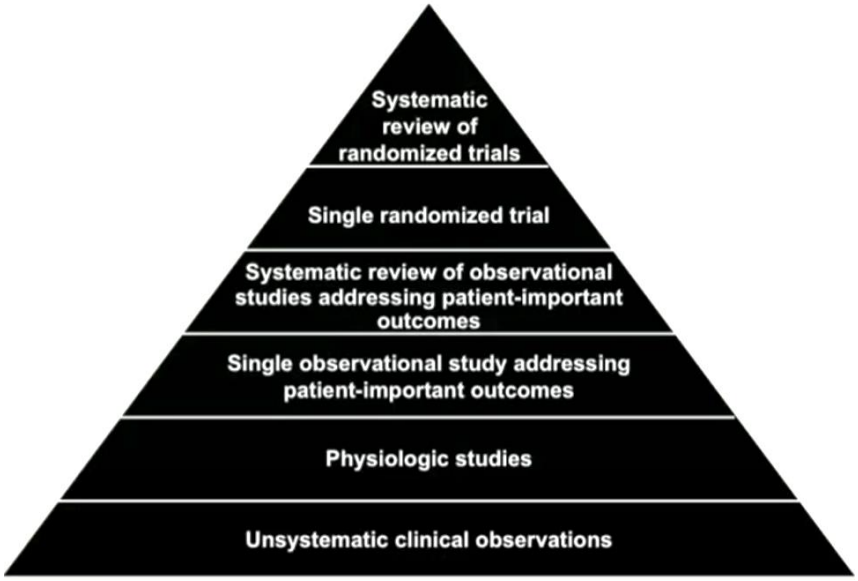
Elements of an analytic framework.

- PICOTS
- Probable transformers and intermediaries of effectiveness
- Illuminates associations between transitional and health conclusions.

Classification of Research Question

- Prevalence- Surveys, cohort studies
- Incidence-Surveys, cohort studies
- Therapy-Clinical trials
- Screening- Clinical trials
- Diagnostic Accuracy- Clinical trials, cross- sectional studies
- Prognosis- Clinical trials, cohort studies
- Harm- Clinical trials, cohort studies, case control studies
- Aetiology- Cohort studies, case control studies

Hierarchy of evidence for intervention studies



"Week 3- Searching and Bias evaluation"

11 videos, 2 quizzes

This module pertains to the significant sources, principles of searching, and assessing the risk of bias.

- **Searching Principles in finding evidence.**

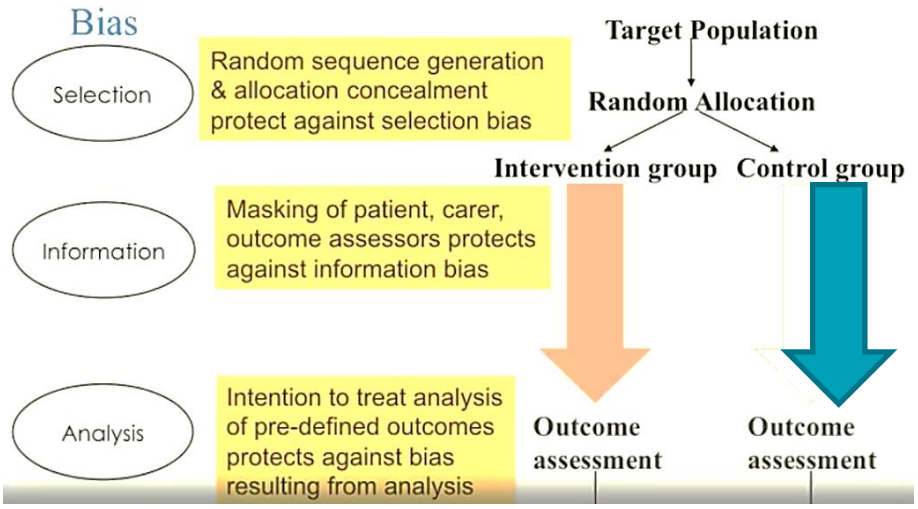
- Develop a practice of conducting a research database and hand-searching through datum and strategies with duplicate screening.

- **Recognizing vital sources and approaches to searching.**
  - Major referential electronic databases are- "PubMed, MEDLINE, EMBASE, ISI web of science Cochrane library, national and regional databases, object-specific databases and citation databases."
  - For searches use"controlled vocabulary, Medical Subject Headings(MeSH), publication type, and keywords.
  - Other sources like "Trial registers, Gray literature searching, personal contacts."
  - Techniques like hand-searching and "snowballing."
- **Establishing quality search approaches.**
  - Develop search based on a well-defined question, disrupt the PICO elements and find the synonyms as well
  - Adopt Boolean concepts like "AND" and "OR."
  - Use MeSH and keywords as a controlled vocabulary.
  - Review the search approach.
  - Encompass test design filter.
- **Documenting the search and outcome.**
  - Produce an inclusive, subtle search.
  - Proceed an iterative search approach for electronic database, starting with your question PICO
  - Use all automated and "hand" resources
  - Document when, where, how, and what was found in the search.
- **Significance of risk of bias.**
  - Bias in methods in the studies included and in the systematic review as well.
  - Components of study quality
    - "Internal validity"
    - "External validity"
    - "Relevance, originality"
    - "Ethics"

        - Protocol violations
        - Quality of record-keeping and study procedures
        - Degree of reflection of the actual study
        - Falsification and fabrication.
    - Main quality domains of biases to be controlled-
    - Selection bias
    - Information bias
    - Bias in analysis

- **Selection Bias**
    - Can be prevented by random sequence generation and allocation concealment
- **Information Bias**
    - Can be prevented by masking (single or double) of participants and personnel part of the research.
- **Analysis Bias**
    - Losses to follow up, noncompliance, withdrawals, and changes in outcome are the analysis bias can be prevented by preconditioning of primary and secondary conclusions against type 1 error.

Sources of Bias in an RCT



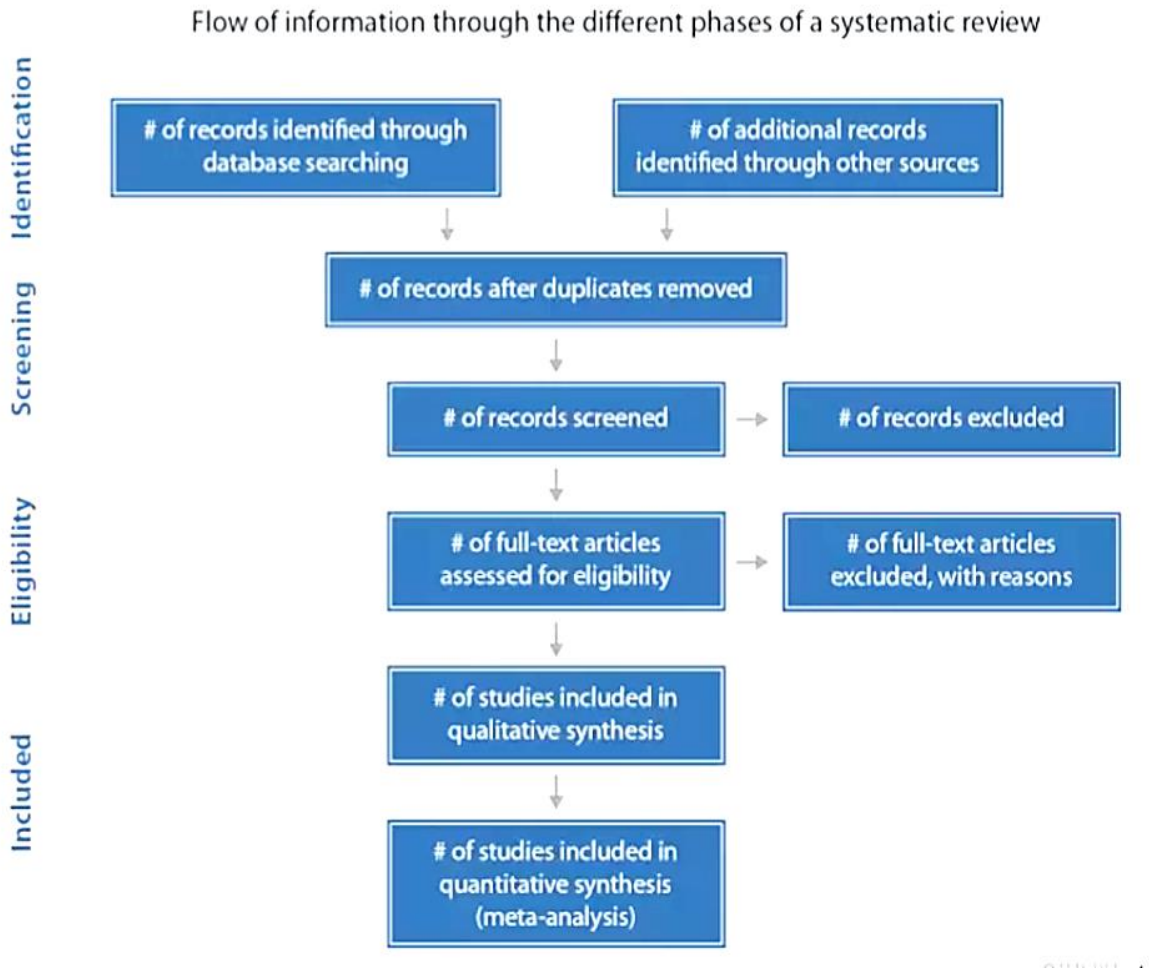
9 Videos, 2 quizzes, 1 field interview.

Abating and minimalizing different types of biases with synthesis and interpretation of results.

- **Standardized Systematic Reviews**
    - Introducing a systematic review requires founding a review unit to supervise the bias, verbalize a topic, and compose the protocol publicly accessible.
    - After directing an all-inclusive search of the studies, documentation, management, and appraisal of each study is very crucial.
    - A standardized method is desired to organize a qualitative synthesis or sometimes even the quantitative analysis as meta-analysis
    - When doing a meta-analysis, expert methodologists are mandatory while addressing study heterogeneity, accompanied by statistical uncertainty and performing sensitivity analysis.
    - Structured reporting of the systematic review requires peer reviewing and then publishing on a public forum.
- Selection Bias
    - Types of selection Bias include-
        - "Reporting Bias- Publication bias, Selective Outcome Reporting, Ascertainment bias.
        - "Inclusion Bias.
    - Unpublished Data can be regained by correspondence requests by emails
- Information Bias
    - Types of information bias include-
        - The precision of quality assessment- Masking writers, institutes, journals, and study outcomes impact the review outcome.
        - The precision of data abstraction- With no significance in the case of meta-analysis, this error can be reduced by single and double data extraction
        - The extensiveness of data abstraction.

- Analysis Bias
  - Predefined outcomes protect against the analysis bias.

- **Transparent reporting**
  - PRISMA and MOOSE (meta-analysis of observational studies in epidemiology)
  - Standards for minimalizing meta-bias include-
    - Thorough screening and search of multiple electronic databases, unpublished grey literature for dwindling selection bias
    - Diminish the faults in data extraction to tend to information bias.
    - Analysis bias can be subsided by up-to-date searches, clearly defined outcomes, and heterogeneity.



PRISMA FLOWCHART

- **Qualitative synthesis and result interpretation.**
    - Qualitative synthesis is the assessment of the main evidence for details about the inclusion of exclusion of studies, their sizes, or even quality.
    - It describes, interprets, evaluates, and concludes.

"Week 5- Devising the meta-analysis and statistical procedures"

9 videos, 2 quizzes

- **Planning the Meta-analysis**
    - Devising the analysis on primary studies can be

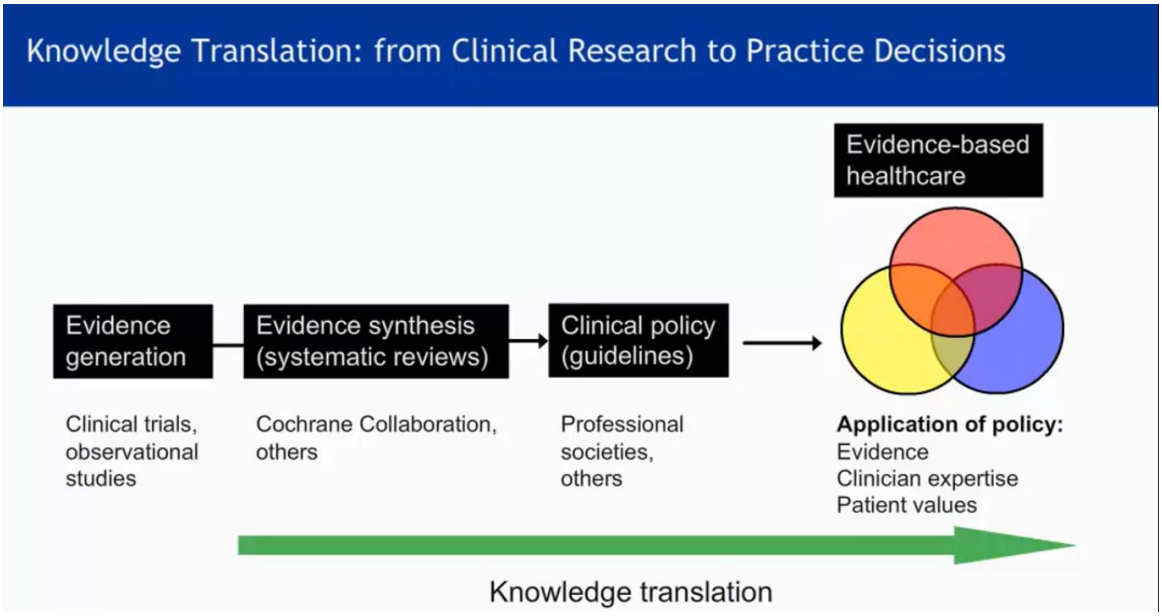
- Qualitative with organized summary, explanation, and discussion.
- Quantitative with meta-analysis or statistical analysis.

- The association and size of the effect are as important as the consistency and strength of the effect.
- Followed by the aim of review analysis can be done by obtaining the size of the effect, comparison of multiple interventions, or relationship between size and other characteristics.

- **Meta-analysis -an introduction**
  - The statistical analysis of a large collection of analysis results from individual studies to integrate the finding.
  - The inclusive degree of effect is measured by a weighted average of the outcome of discrete studies.
  - Unavailability of evidence is not equal to evidence of unavailability.
- **Meta-analysis is done to**
  - Improve the power and accuracy with better detection and narrower confidence intervals and quantify sizes of effect and their uncertainty.
  - Evaluate the homogeneity/heterogeneity of outcomes from different studies.
  - Answer multiple questions of comparative interventions by probing factors differing across studies and generate new hypothesis
- Data types and measures of effects.
  - Data can be of the following types- dichotomous, continuous, ordinal, counts of occasional measures, and time-to-event.
- Fixed effect model
  - Assumptions like
    - all the studies are the same and true to size.

- Random sampling is to be included.
- Symbolize the true effect the theta
- Study weights are assigned proportionally to the inverse of the variance.

- Random effects model
  - It assumes a distribution or dispersal of true effects.
  - The summary effect in the estimate of the mean of the true effects and the mean for the null hypothesis is 0.
  - Take into consideration two sources of variance (within and between)



Summary of Knowledge Translation- Clinical Research To Practice Decisions

Conclusive learnings gained from the overall online course.

- Systematic review is the highest level in the hierarchy of evidence for intervention study.
- Systematic Review practices unambiguous, prearranged methods to categorize, select, evaluate, recapitulate, and produce results from comparable but distinct studies. The systematic review can be updated after publishing.
- Meta-analysis is the numerical technique of investigating and quantifying a hefty assemblage of results from discrete studies. It can be represented with forest plot. Meta-analysis can only be undertaken with systematic reviews not vice versa.
- Advance in developing an accountable research question employing of the "Participants Interventions Comparisons Outcomes" (PICO) outline.
- Pertaining to the elaboration and solution of different kinds of biases was also seen as an outcome of the course. **Selection Bias-**Can be prevented by random sequence generation and allocation concealment. **Information Bias**-Can be prevented by masking (single or double) of participants and personnel part of the research. **Analysis Bias-**Losses to follow up, noncompliance, withdrawals, and changes in outcome are the analysis bias can be prevented by preconditioning of primary and secondary conclusions against type 1 error.
- Qualitative synthesis is the assessment of the main evidence for details about the inclusion of exclusion of studies, their sizes, or even quality. It describes, interprets, evaluates, and concludes.
- Fixed effect and Random effect models are the two types of meta-analysis.
- Meta-analysis thus, answers multiple questions of comparative interventions by probing factors differing across studies and generate new hypothesis.
- Transparent reporting requires PRISMA and MOOSE (meta-analysis of observational studies in epidemiology)
- Systematic review is an integral part of evidence-based research with application of clinical expertise, patient value and evidence.