

SUMMER TRAINING
PROJECT REPORT
ON
ROLES, RESPONSIBILITIES AND FACTORS INFLUENCING
ASHA PERFORMANCE IN MATERNAL AND CHILD CARE
INDIA
(2000-2018)

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REPORT
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ACRONYMS

AWW	Anganwadi Worker
ASHA	Accredited Social Health Activist
ANM	Auxiliary Nurse Midwife
MoHFW	Ministry of Health and Family Welfare
MoWCD	Ministry of Women and Child Development
WHO	World Health Organization
MCH	Maternal and Child Health Care
UNICEF	United Nations International Children's Emergency Fund
MTP	Medical Termination of Pregnancy
NRHM	National Rural Health Mission
SPSS	Statistical Package for Social Science
USAID	United State Agency for International Development
MMR	Maternal Mortality Rate
IMR	Infant Mortality Rate

Abstract

Accredited social health activists (ASHAs) are one of the key elements of National Rural Health Mission (NRHM) programme. ASHA being the grass root level worker, the success of NRHM depends on how efficiently is ASHA able to perform. The key selection criteria such as education level, representatives of the local community, adequate knowledge and preparedness to perform effectively are found to be extremely crucial for sustainability and retention. Large number of urban and rural areas have been completely left out or poorly targeted due to lack of sensitization among service providers and a sense of apathy towards urban poor. ASHA being a local women selected by the society is chosen and trained to perform as an effective link worker for better use of health facilities. The present study has been conducted to access ASHAs roles, responsibilities and factors that influence their performance in maternal and child healthcare India. Journals, research papers have been collected for analysis. The study covers a period of eighteen years from 2000 to 2018. The collected data has been analyzed by using descriptive statistics to understand realization and proficiency of ASHA workers. ASHA is an important part of NRHM in meeting the “Millennium Development Goal”. She serves as a health worker by providing outreach services to areas where access is often limited. Her role is multifaceted involving knowledge and practice in the fast changing health scenario and society and thus it is crucial for them to be skilled, educated, dedicated and motivated towards their work. There is a need for continuous and consistent training, recognition and reinforcement for better performance, motivation and also for retention. Less knowledge of work component, less cooperation from health staff, delay refilling of drug kit, incentive oriented practices, delayed and inadequate payment of incentives, lack of awareness about intra natal, post natal, new borne care, immunization, nutritional requirements and deficiencies, affected their work performance. Due to number of issues their practices are affected which need to be addressed through skill based training in terms of problem solving and good communication. Monitoring should be made an integral part of ASHA working in field to ensure that knowledge is converted into practice as well.

Keywords: ASHA, MCH, NRHM, Performance Indicators of ASHA.

Introduction

In India frontline workers are women who come from the communities that they are serving and act as an essential link to health facilities by bringing health services directly to communities, where access is often limited. Three types of frontline workers, AWW, ASHA, ANM, fall within the purview of two ministries, the ministry of health and family welfare (MoHFW) and the ministry of women and child development (MoWCD). Accredited Social Health Activist (ASHA) program was established by the National Rural Health Mission (NRHM) in 2010 with an aim to improve health outcomes particularly among women and children, to reduce geographic and socio economic disparities. According to WHO (1976), maternal and child health care services can be defined as promoting, preventing, therapeutic or rehabilitation facility or care for the mother and child. Maternal and child health care services were first organized in India in 1921 by a committee of “The Lady Chemsford League” which collected funds for child welfare. MCH strategy is to provide mother and child health services an integrated package of “essential healthcare” also known as primary health care. Reduction of maternal, prenatal, intranatal, postnatal, under five mortality and morbidity, promotion of reproductive health, prevention of malnutrition and communicable diseases, early diagnosis and treatment of health problems, health education and family planning are prime focus of MCH. MCH services are rendered through the infrastructure of primary health centers and sub centers. ASHAs are recruited and trained to work in their own communities as health activists, educators and providers of basic essential services. Their roles and responsibilities in maternal and child health care are as follows, survey of health and related events, maintaining data, participation in community level health planning and allied activities, identifying and registering new pregnancies, births and deaths, identifying, managing or referring cases of illness, mobilizing, counselling (breast feeding, prevention of diseases) and supporting the community to demand and seek services(health, nutrition, government related provisions), supporting health service delivery through home visits, first aids, immunization sessions, ante and post natal care, institutional deliveries, family planning, diagnosis and provision of drugs.

Statement of problem:

Mothers and children not only constitute a large group but they are also among the vulnerable groups. The vast majority of maternal and child deaths occur despite existing known and affordable treatments. In India, under five mortality rate (Deaths per 1000 live births) - 36.6 (male 36, female 37) 2018, infant mortality rate (Deaths per 1000 live births) - 30 (male: 29.88611442, female: 29.95410796) 2018, neonatal mortality rate (Deaths per 1000 live births) – 23, (UNICEF 2018 data), maternal mortality rate: 145/100,000 live births (2017).

Table1

Percentage distribution of Population by broad age groups to Total Population by sex and residence, India, 2018

Residence	Sex	Broad age groups (years)							
		0-4	5-9	10-14	0-14	15-59	60+	15-64	65+
Total	Total	8.0	8.6	9.3	25.9	66.0	8.1	69.0	5.1
	Male	8.2	8.8	9.5	26.4	65.7	7.8	68.7	4.9
	Female	7.8	8.4	9.1	25.3	66.3	8.4	69.3	5.4
Rural	Total	8.6	9.1	9.8	27.5	64.5	8.0	67.4	5.1
	Male	8.8	9.3	10.0	28.1	64.3	7.6	67.1	4.9
	Female	8.4	8.9	9.6	27.0	64.7	8.4	67.6	5.4
Urban	Total	6.8	7.6	8.2	22.6	69.1	8.3	72.3	5.1
	Male	6.9	7.8	8.4	23.1	68.7	8.2	71.9	5.0
	Female	6.6	7.4	8.0	22.0	69.6	8.4	72.7	5.3

The Crude Birth Rate during 2018 stands at 20.0. There is a decline of 0.2 points over 2017. Maximum has been reported in Bihar (26.2) and minimum in Kerala (13.9). Maximum infant mortality rate has been observed high in Madhya Pradesh (48) and minimum in Kerala (7). One point decline in infant mortality rate has been seen from 2017 to 2018.

FIGURES AT A GLANCE, INDIA - 2018				
Item		Total	Rural	Urban
V. Percentage distribution of Current live births by birth interval (in months)				
	10-12	1.6	1.6	1.7
	12-18	7.8	8.2	6.4
	18-24	13.8	14.7	11.3
	24-30	14.3	15.4	10.9
	30-36	12.9	13.5	11.1
	36+	49.6	46.7	58.6
VI. Mortality Indicators				
	Crude Death Rate	6.2	6.7	5.1
	Percentage of infant deaths to total deaths	10.5	11.6	7.4
	Percentage of deaths of less than one week to total infant deaths	54.6	56.9	44.9
	Under-five Mortality Rate	36	40	26
	Infant Mortality Rate	32	36	23
	Neo-natal mortality rate	23	27	14
	Early neo-natal mortality rate	18	20	10
	Late neo-natal mortality rate	6	6	3
	Post neo-natal mortality rate	9	9	9
	Peri-natal Mortality Rate	22	25	14
	Still Birth Rate	4	4	4
VII. Percentage distribution of births by type of medical attention at delivery				
	Government Hospital	54.5	53.8	56.3
	Private Hospital	28.0	24.2	38.4
	Qualified Professional	9.7	11.6	4.5
	Untrained Functionary and Others	7.8	10.3	0.8
VIII. Percentage distribution of deaths by type of medical attention before death				
	Government Hospital	29.4	27.1	35.4
	Private Hospital	18.5	16.1	24.9
	Qualified Professional	33.0	33.7	31.0
	Untrained Functionary and Others	19.2	23.1	8.7

Table 2 Percentage distribution of current live births by birth intervals, mortality indicators, percentage distribution of births by type of medical attention at delivery, percentage distribution of deaths by type of medical attention before death.

Trend of Birth rate, Death rate, Infant Mortality rate, Total Fertility rate, Sex ratio at Birth and Sex ratio of children (0-4 age group), India

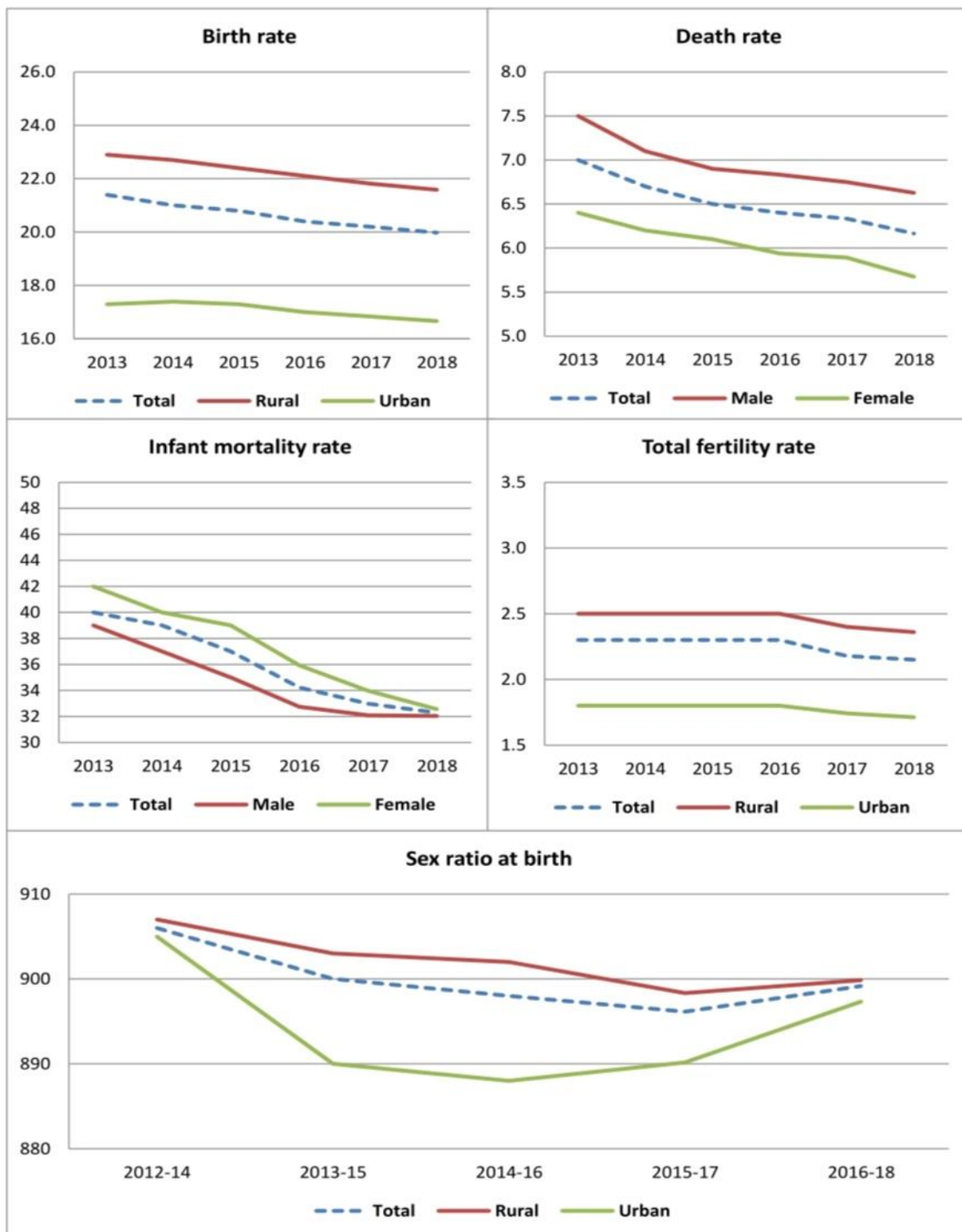


Table 1: Maternal Mortality Ratio (MMR), Maternal Mortality Rate and Life Time Risk; India, EAG & Assam, South and Other states, 2016-18

India & Major States	MMR	95% CI	Maternal Mortality Rate	Lifetime risk
INDIA	113	(103-123)	7.3	0.3%
Assam	215	(133-297)	14.0	0.5%
Bihar	149	(104-194)	15.1	0.5%
Jharkhand	71	(20-123)	5.6	0.2%
Madhya Pradesh	173	(126-221)	15.9	0.6%
Chhattisgarh	159	(69-249)	12.1	0.4%
Odisha	150	(96-205)	9.7	0.3%
Rajasthan	164	(112-215)	14.5	0.5%
Uttar Pradesh	197	(152-241)	17.8	0.6%
Uttarakhand	99	(49-150)	6.4	0.2%
EAG AND ASSAM SUBTOTAL	161	(143-180)	13.2	0.5%
Andhra Pradesh	65	(26-104)	3.6	0.1%
Telangana	63	(16-110)	3.6	0.1%
Karnataka	92	(53-131)	4.9	0.2%
Kerala	43	(10-77)	2.1	0.1%
Tamil Nadu	60	(29-92)	3.2	0.1%
SOUTH SUBTOTAL	67	(50-84)	3.6	0.1%
Gujarat	75	(41-109)	5.1	0.2%
Haryana	91	(43-139)	7.0	0.2%
Maharashtra	46	(19-73)	2.6	0.1%
Punjab	129	(56-202)	7.0	0.2%
West Bengal	98	(59-137)	5.0	0.2%
Other states	85	(62-108)	4.5	0.2%
OTHER SUBTOTAL	83	(68-97)	4.7	0.2%

The risk of maternal and infant mortality and pregnancy related complications can be reduced by increasing access to quality preconception, prenatal and interconception. Their wellbeing determines the health of the next generation and can help predict future public health challenges for families, communities and the health care system. Considering above mentioned problems

we attempt to do this study to assess the factors that influence ASHAs roles and responsibilities in maternal and child health care so as to improve the uptake of healthcare services and other benefits across beneficiaries.

Objective:

To study the awareness and perception of ASHAs regarding their roles and responsibilities in maternal and child health care delivery system.

To determine competency and motivational level of ASHA in conducting their role efficiently.

To study the facilitating and inhibiting factors affecting their performance in delivering maternal and child health care services.

To expand data available for quality improvement and demonstration of value.

Methodology:

The present study has been conducted to access ASHAs roles, responsibilities and factors that influence their performance in maternal and child healthcare India. Journals, research papers have been collected for analysis. The study covers a period of eighteen years from 2000 to 2018.

The collected data has been analyzed by using descriptive statistics to understand realization and proficiency of ASHA workers. Let us look into certain data extracted through journals and research papers and analyze the trends and patterns.

Review of Literature:

Bhargavi C N et al.(2014), study was conducted to assess awareness of ASHAs on MCH care in Delhi and to relate the association of knowledge with specific demographic variables. Eight community settings of Delhi South, South East, South West, East, North East, West, North West and Central zones were selected for survey. Randomly five hundred ASHAs were selected and were interviewed by using a structured questionnaire. SPSS was used to analyze the data. Conclusions were drawn on the basis of analysis and it was found that majority of them were aware about positive health behavior services on family planning, sex education, menopause, reproductive tract diseases. But nearly half of them were not comprehended regarding intra natal, post natal, new born care, immunization,

nutritional requirement, nutritional deficiencies, unsafe abortions and MTP. ASHAs with more years of experience were found to be significant in their role when compared with those having lesser experience. Age factor didn't play much role in their performance.

Kaur et al.(2015), five health blocks of District Ludhiana, Punjab were selected to conduct a descriptive cross sectional study from December 2013 to 2014. One seventy ASHAs were selected randomly, ten Anganwadi workers, 10 Auxiliary nurse midwife and 10 Panchayati raj institution representatives were selected to evaluate the knowledge of ASHA and services rendered by her to community. Structured questionnaire was used to interview and collect responses of participants. Descriptive and inferential statistics were used to analyze the data. Chi square and non parametric statistical technique was used to find the association between the level of knowledge and selected socio demographic variables.

Guha et al.(2018), study was conducted to assess awareness and perceptions of ASHA regarding their role and responsibilities and factors influencing their performance in health care system. Primary health centers in Wardha district, Maharashtra, had undergone a qualitative study in seven selected villages. ASHAs were selected through non probability sampling and in depth interview were conducted. It was found that ASHAs were aware about their roles and responsibilities but were more inclined towards higher incentive performance. Their clarity as with respect to their roles as facilitator, social activist and service provider was found somewhat compromised. Ignorance was observed among them towards newly launched national programs. Supervision of their performance, appraisal by higher authority and support from community proved to be positive influencing factors in their performance. Workload, poor orientation to program, lack of qualitative training and delayed monetary incentives were some of the challenges

Mondal et al.(2017), unmatched case control study was conducted to identify factors associated with low performance of ASHA regarding maternal care in Howrah District, West Bengal. 993 ASHAs as low cases and 994 as control cases were categorized based on average incentive received by each ASHA, among them 261 cases and 261 control were randomly selected. They were interviewed to collect information regarding factors that influence their performance such as workload, socio economic details, training, support and supervision. Crude and adjusted odd ratios with 95% confidence interval using simple and

multi logistic regression was used for analysis. It was found that low performance of ASHA was associated with population burden, lack of IFA in stock, inadequate supervision by ANM.

Kohli et al.(2015), in the North East district of Delhi, descriptive cross sectional study was conducted among 55 ASHAs. Pre tested and semi structured questionnaire was used to collect data on socio economic demographic profile of ASHA, knowledge and practices about their role and responsibilities and difficulties faced in communities. SPSS software was used to analyze data. Quantitative data was expressed in mean + SD whereas qualitative data was expressed in percentages. Mean age of ASHA was 31.84 + 7.2 years. Most of them were married (96.4%) and were serving population of 1000 – 2000(87.3%). It was found that majority of them were aware of their work of maternal and child health services. But however lesser number were aware about their role in registration of deaths, births and measures to treat minor ailments. They even reported problem of lack in coordination between them and ANM.

Parost et al.(2012), in four blocks of Lucknow a cross sectional study was undertaken with an objective to study the factors influencing overall performance of ASHAs in MCH care services. Sample size of four hundred ASHAs was selected through multistage random sampling technique. For statistical analysis, simple proportion and chi square test were used. Their performance was judged on the basis of work performed to the work expected from them in MCH care. Their performance was divided into four categories namely, very good (>76%), good (51-75%), average (26-50%), poor (0-25%). As per their assessment, majority were found into good category, followed by 30.7%, 3.8% and 2.8% into average, poor and very good category of performance respectively. Their performance was found to be significantly influenced by factors such as type of family, socioeconomic class, getting cash incentive total and timely, time taken to reach at place of delivery, family and community support, population served, networking ability.

Srivastav et al.(2009) In Gorakhpur the study surface of interface of ASHA with the community and the service providers in Eastern Uttar Pradesh was conducted. Different parameters were evaluated to analyze factors that affect performance of ASHA workers. The study also focuses on coordination of ASHA with different stakeholders. Training and

selection procedure of ASHA, knowledge and communication, skills, motivational factors were the parameters that were assessed. It was found that ASHA was not able to function adequately due to lack of periodic training, lack of motivation, lack of coordination and understanding between ASHAs, ANM and AWW. The study concluded by recommending various suggestions to improve ASHAs performance in health care delivery system.

Thakre et al.(2012), In Nagpur study was conducted to evaluate the gaps in knowledge level of ASHA workers and effectiveness of their training course on feeding practices. The research was cross sectional and sample size of ASHA was 94 workers and 5 supervisors. A pre designed questionnaire was structured for data collection. SPSS software was used for the analysis of the data. It was found that lack of knowledge and skills hindered their performance.

Findings:

ASHAs with more years of experience were found to be significant in their role when compared with those having lesser experience. Their ability with respect to their role as facilitator, social activist and service provider was found to be somewhat compromised. Though they were aware about positive health behavior services on family planning, sex education, menopause, reproductive tract disease, but were not comprehended regarding intra natal, post natal, new borne care, immunization, nutritional requirements and deficiencies. Ignorance was observed towards newly launched national programs.

Their performance was found to be positively influenced by factors such as timely motivation, supervision, and evaluation.

ASHAs were not able to function adequately due to lack of periodic training, lack of motivation, lack of coordination and understanding between ASHA, ANM and AWW.

Population burden, inadequate drug supply, cash incentive based work, time taken to reach work place hindered their work performance.

Limitation:

Challenges and constraints affect their ability to function effectively and efficiently.

The impact of ASHA on their communities is largely dependent on their knowledge, skills, quality of training, timely supervision. Their literacy level differs widely across states, ASHAs come from poorer background and face difficulty in reading and writing. Limited opportunities for continuing education, less of efficacy in training, lack of strong supervision and evaluation, not only affects their ability to discharge daily activities, but also makes them less confident to deliver new ideas in group settings. Unfamiliar ideas and topics like condom use, hinder them from speaking socially.

Their work is not structurally defined, they perform list of work and still have limited avenues to earn income, they aren't paid timely, which draws their attention towards high incentive based services as monetary incentives fail to attract their interest. The front line workers constitute an important element of the system as the data provided by them is analyzed for planning, implementation, evaluation, of health policies. At times they are unaware about their crucial role in health care system and are more focused on high incentive.

They are not equipped or sufficiently trained to handle all responsibilities. ASHAs need to be mobile, as they serve as an essential link to health facilities by bringing health services directly to communities where access is often limited. They are even required to work at odd hours. Lack of family support for working at odd hours, issues they face due to strenuous mobilization, no proper transportation facility, large work load, excessive paper work mostly maintaining various registers all these factors affect their ability in delivering health services to beneficiaries.

Most ASHAs complained of not receiving timely and adequate supply of drugs and equipment, so they have to face stock out of drugs which hamper their service delivery.

Community dynamics creates cultural constraints as ASHAs need to engage themselves with all community stake holders. Families belonging to upper income group may object interacting closely with front line workers or front line workers may not interact openly with those belonging to very low socio economic group. Thus caste, culture, misbeliefs, socio economic group and gender influences ASHAs work.

Recommendation:

Emphasis should be given for better selection criteria which goes beyond their education and age. It is important to ensure some basic skills during recruitment such as communication skills, inter personal skills, work ethics, propensity to learning, team work, adaptability, work management. Effective and efficient training, monitoring, evaluation, supervision during field work will help enhance their knowledge and skills and bring about further growth in their health delivery system.

ASHAs perform a list of work, their work should be structurally defined. They should be motivated for their work and guided for further improvement. Motivation should not be limited in providing incentives, but rather they should be motivated morally and should be made aware of their importance in health care system. Poor monetary avenues hinder them from performing effectively and thus they are more inclined towards high incentive work. Timely and adequate salary should be paid through e banking system for smooth functioning of work.

Paper workload can be reduced by incorporating digital system for entering data. This will also ease data analysis and human error can be minimized. At times front line workers need to work at odd hours and hence they should informed prior to avoid any disapproval from family. Family members should be aware of their work so that they can support completely. ASHAs need to be mobile as they provide health services directly to the communities where access is often limited. Improper transportation facilities delays their work and at times they refuse to work at such locations.

Drug and equipment supply should be adequate for efficient and smooth work functioning. They should be educated and made aware of drugs and equipment they are handling. At times even if they are equipped with right medical care, they aren't aware about its usage.

Socio economic factor, gender, culture, caste, misbeliefs serve as challenges in delivering health care services to the beneficiaries. Community recognition, support and respect of ASHA is very essential for them to carry out work effectively and efficiently.

Conclusion:

ASHA is an important part of NRHM in meeting the “Millennium Development Goal”. She serves as a health worker by providing outreach services to areas where access is often limited. Her role is multifaceted involving knowledge and practice in the fast changing health scenario and society and thus it is crucial for them to be skilled, educated, dedicated and motivated towards their work. There is a need for continuous and consistent training, recognition and reinforcement for better performance, motivation and also for retention. Less knowledge of work component, less cooperation from health staff, delay refilling of drug kit, incentive oriented practices, delayed and inadequate payment of incentives, lack of awareness about intra natal, post natal, new borne care, immunization, nutritional requirements and deficiencies, affected their work performance. Due to number of issues their practices are affected which need to be addressed through skill based training in terms of problem solving and good communication. Monitoring should be made an integral part of ASHA working in field to ensure that knowledge is converted into practice as well.

Supplementary Information

USAID

USAID is a global leader in maternal and child health and works to improve the access and quality of basic health services for women and children, helping to save millions of lives.

Twenty five countries that together account for more than two third of maternal and child deaths worldwide are their prime focus.

In India, USAID partners with government, private sector, civil society to meet the health needs of women and children.

It acts as a catalyst to leverage new ideas, mobilize domestic resources and accelerate global progress by uniting new partners around common goal:

- Maternal Health.
- Newborn Health.
- Immunization.
- Child Health.
- Water, Sanitation and Hygiene.

USAID health programs help reduce pneumonia, diarrhea, malnutrition, the leading causes of infant death and thus improve the quality of care at birth.

It helps strengthens the immunization system of India by improving the coverage of existing vaccines and by introducing newer vaccines, such as rotavirus and pneumococcal vaccines.

It ensures availability of essential medicines through technology enabled distribution.

To tackle malnutrition the underlying factor of maternal and child deaths, it promotes positive and sustainable nutritional practices within local communities.

They help strengthen the knowledge and skills of health care providers both in government and private health facilities.

Community level approaches are supported by promoting health behaviors and building the skills of community health workers.

The program focuses on individual's right to make an informed and voluntary choice about their use of family planning and promotes access to any desired family planning method.

Spacing of pregnancies, reducing the number of unintended pregnancies by creating awareness, improving service delivery channels, expanding contraceptive methods availability, reducing out of pocket cost are measures undertaken by USAID to ensure efficient and effective family planning.

Child deaths in India have dropped by 45% since 1990. USAID efforts contributed in saving the lives of an additional 2 million children. Despite this progress, much more work remains, close to 1 million children still die each year. Almost 6,60,000 of them in their first month of life and 32,500 women die annually.

Four thousand one hundred and sixty health care facilities were strengthened by service provision of skilled health care providers.

Fourteen percent decline in neonatal mortality was seen through quality improvements in four hundred and thirty five facilities.

USAID supported work to prevent 25,000 pneumonia deaths and 14,000 diarrheal deaths.

Informed family planning choice was promoted in almost 120,000 urban health and nutrition day sessions in 18 cities.

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PART 2 EPIDEMIOLOGY- THE BASIC SCIENCE OF PUBLIC HEALTH

Course Description:

This course explores public health issues and helps study the distribution and determinants of diseases, health condition or events among populations and application of study to control health problems. It's a six week course which helped me understand the need of epidemiology in today's dynamic society. Its role and importance in various fields. In public health, epidemiological studies are used extensively for disease surveillance, outbreak investigation and observational studies to identify risk factors of zoonotic diseases in both humans and animals and is being widely used by veterinarians and public health professionals. Risk factors detected through epidemiological studies help in disease control measure implementation. Public health policies are planned, implemented, monitored and re-evaluated on the basis of health care data provided through epidemiological studies. Thus it plays a very crucial role in health care management system. Its ever growing need in health care system drew my attention towards this course. Through this course I was able to understand and explore various aspects of epidemiology.

Key objectives:

The objective of this course is to make understand the importance of epidemiology in public health. As it plays a very crucial role in health care system. Through this course they have in depth explained its association with health care system.

To analyze pattern and other information relating to the development and spread of disease or other health conditions.

To gain brief knowledge about epidemiological studies, parameters to be taken into consideration while conducting epidemiological studies so that errors can be avoided

To gain a sense of knowledge of using resources effectively and efficiently in bringing out maximum output.

Introduction

Epidemiology is the study of distribution and determinants of health, related state or events in specified populations and the application of this study to control health problems (John M Last in 1988). According to WHO, it is the study of occurrence and distribution of health related diseases or events in specified populations, including the study of determinants and the application of this knowledge to control health problems. The word epidemiology is derived from Greek word epidemic, epi means among, demos means study of population or people, logos means scientific study. According to the International Epidemiological Association (IEA), epidemiology aims to describe the distribution and magnitude of health and disease problems in human populations, identifies etiological factors in the pathogenesis of disease and provides essential health data for planning, implementation and evaluation of services for prevention, control and treatment of disease and sets priorities among those services.

History:

The history of epidemiology has its origin back to 400BC. Hippocrates, John Graunt (1662), William Farr, John Snow believed that environmental factors influenced the occurrence of disease and did not support the supernatural viewpoint of diseases. Relationship between the occurrence of disease and environmental influences was first examined by Hippocrates. He coined the terms endemic and epidemic. Mortality data was analyzed and published by John Graunt in 1662. He was first to quantify pattern of death, birth and disease occurrence. William Farr initiated systemic collection and analization of mortality statistics. He is considered father of vital statistics and disease classification. John Snow conducted classical study in 1854 when an epidemic of cholera developed in the golden square of London. He conducted study to discover the cause of disease and prevent its recurrence. Farr was adhered to miasmatic theory of disease, according to this theory disease is transmitted by a miasma or cloud and thus strongly opposed classical study of John Snow. But however, Snow believed and proved that outbreak of cholera was through contaminated water and this was the major achievement in the field of epidemiology. Others pioneers include Danish physician P.A Schleisner 1849, his work was related with the prevention of epidemic of tetanus neonatorum in Iceland. Hungarian in 1847 brought down infant mortality at Vienna hospital by instituting disinfection procedure. His findings were published in 1850, but his work was not widely accepted by his colleagues.

British surgeon Joseph Lister discovered antiseptics in 1865 in light of work of Louis Pasteur. In the early 20th century, mathematical methods were introduced in epidemiology by Ronald Ross, Anderson Gray Mckendrick and others.

Evolution:

Year	Transformation
1873	Epidemiologist were driven towards infectious diseases and epidemics.
1951	Focus was not just on infectious diseases but also towards specific conditions associated with them
1962	Laws governing distribution of disease at community level were taken into consideration
1988	Control, prevent spread and recurrence of diseases was their prime focus in year 1988.

Epidemiologic Transition:

Transition	RESULTING CHANGE
Hunter-gather to cities	From few epidemics to major epidemics

Immunologic resistance

From major epidemics to endemic diseases

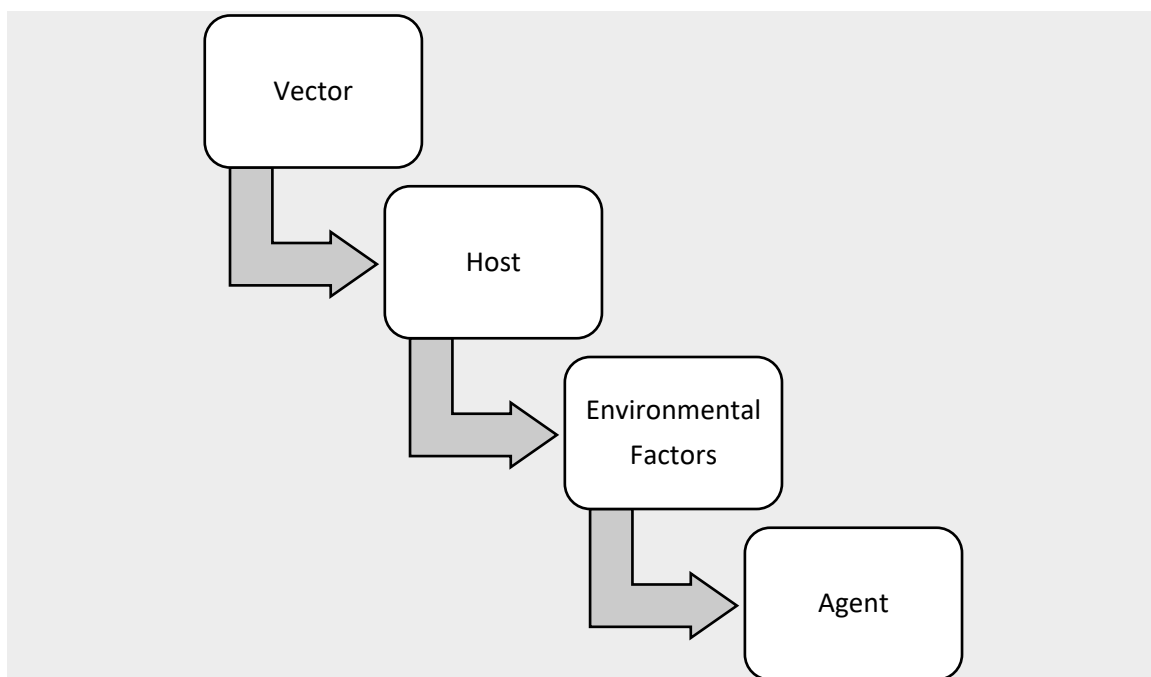
Public health and sanitation

From infectious to non-infectious (chronic diseases)

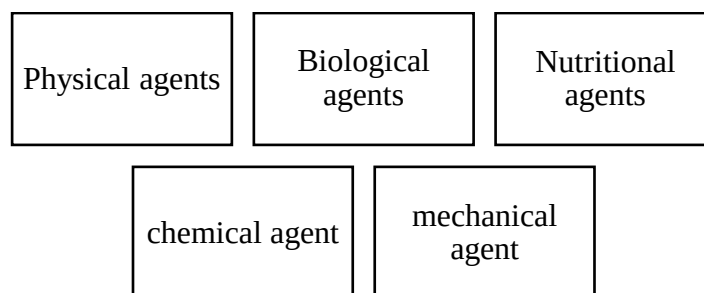
Increased globalization

Resurgence of infectious diseases and high prevalence of chronic diseases

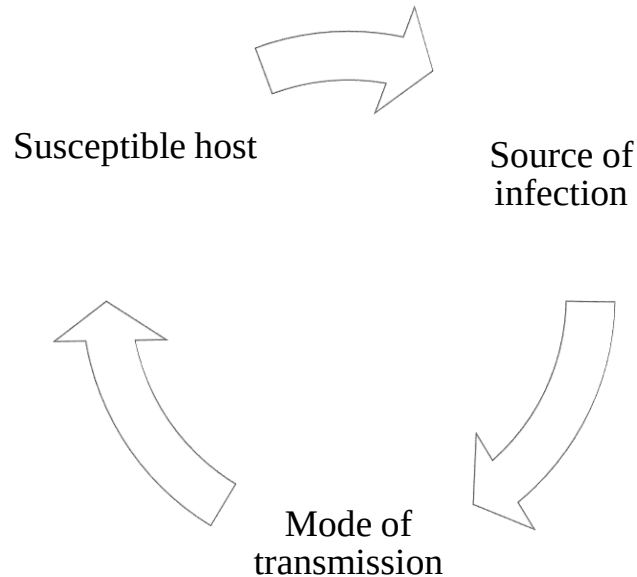
Epidemiological Triads:



Agent: Specific living or inanimate object that can cause health problems to host.



Dynamic of disease transmission:

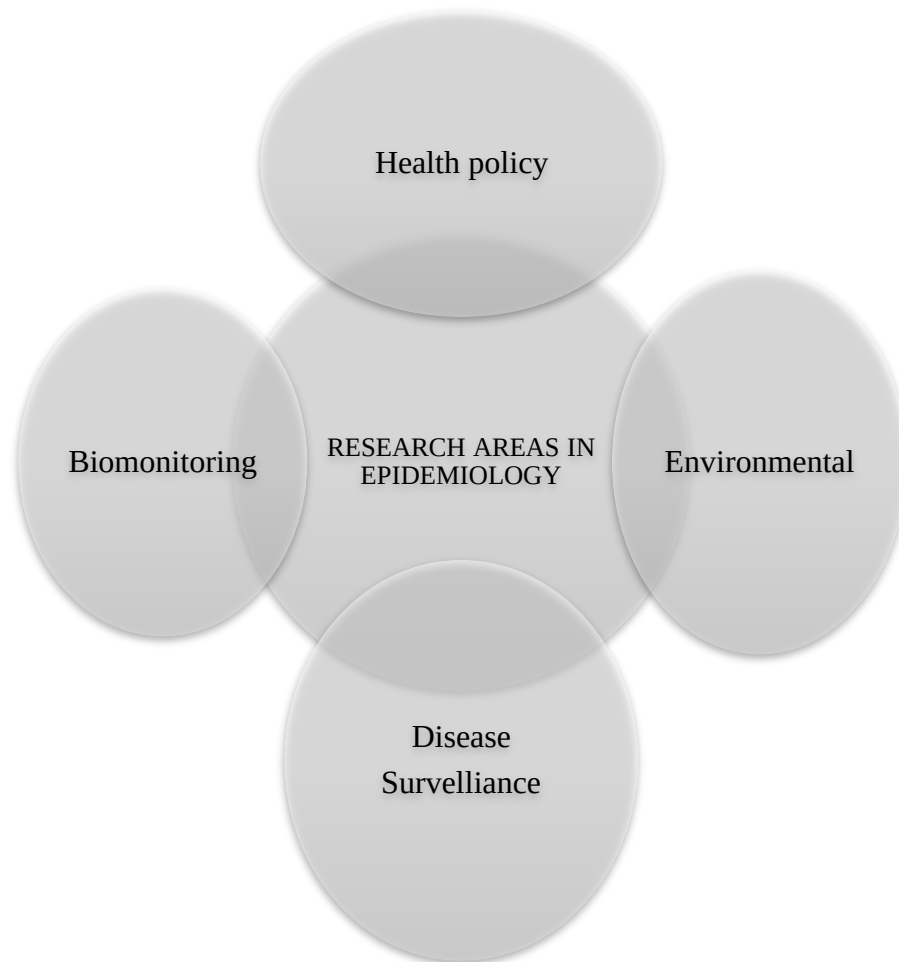


Components of epidemiology:

Disease Frequency:	Distribution of Disease:	Primary Determinants:
Rate, ratio, analysis of the incidence and prevalence of disease are main measures of disease frequency.	Health events occur in pattern in community and it varies from community to community.	Epidemiology helps in identifying the causative agent or the risk/ predisposing factors of diseases.
Incidence rate = number of new cases during a given period/ population at risk during the same period x 10n.	Distribution of events are based on time, place and person.	Understanding the factors leading to any program for the control of those diseases.
Prevalence = All new and preexisting cases during and given time period/	Distribution of disease helps to describe the pattern of disease as well as to formulate hypotheses	

population risk during the same time period x 10n Odd ratio: Diseased and exposed / healthy and exposed upon healthy and exposed/ healthy and non-exposed.	concerning casual or preventive factors	
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Research areas using Epidemiology:

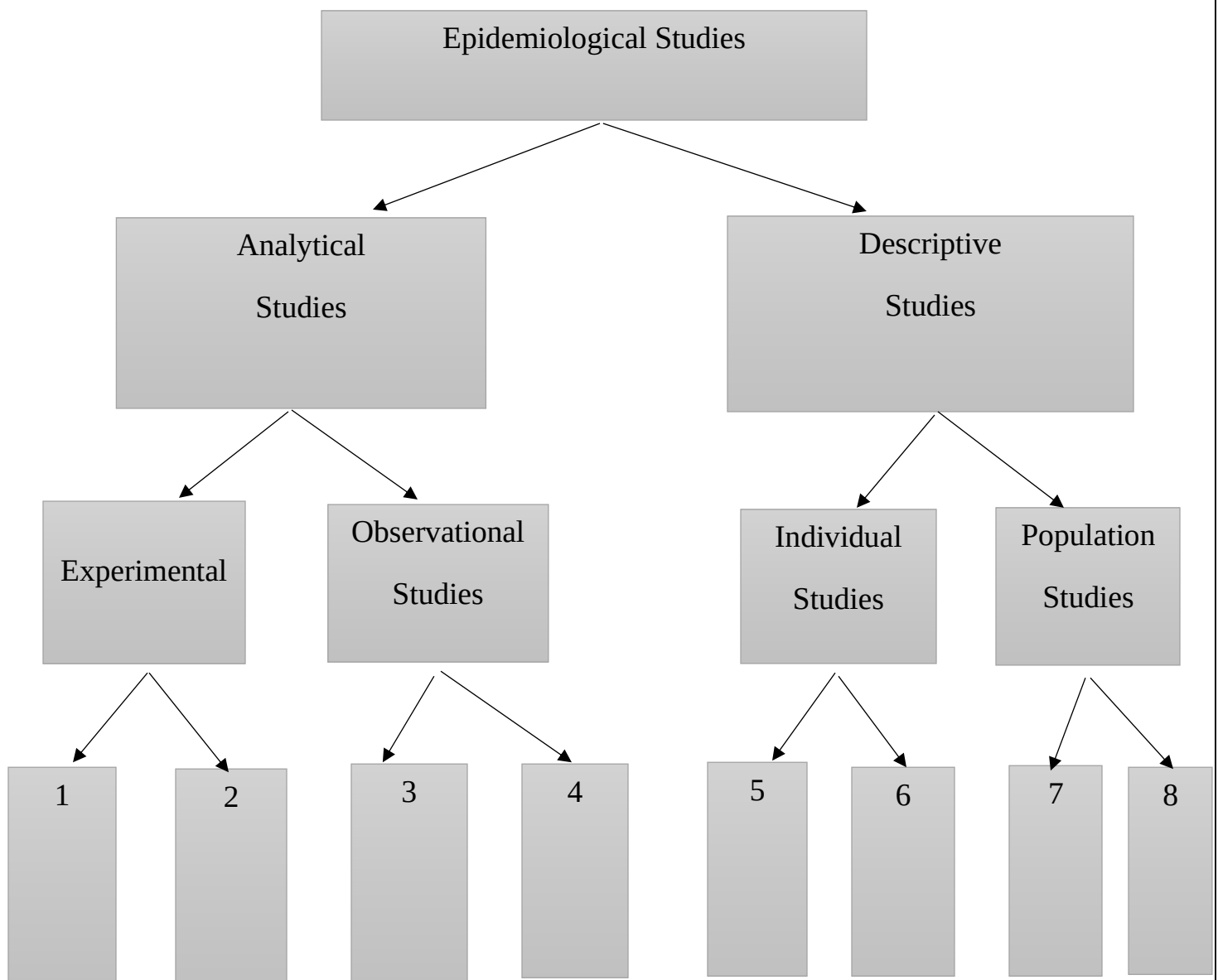


Epidemiology - Public health: Epidemiological methods for disease surveillance, outbreak investigation and observational studies to identify risk factors of zoonotic diseases in both humans and animals is been widely used by veterinarians and public health professionals.

Risk factors detected through epidemiological studies help in disease control measure implementation. The use of hazard analysis critical control point (HACCP) system depends greatly on the information produced by epidemiological studies.

Epidemiology plays an essential role in community diagnosis of presence, nature and distribution of health and disease among population and the dimensions of these in incidence, prevalence and mortality.

It helps understand the disease process and thus helps in planning, implementation and evaluation, monitoring of disease and control measures.

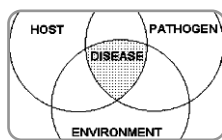


- 1: Community Trial
- 2: Clinical Trial
- 3: Cohort Study
- 4: Case Control Study
- 5: Case Series
- 6: Case Report
- 7: Cross Sectional Study
- 8: Correlational Study

Methodology:

The University of North Carolina at Chapel Hill, nation first public university is known around the world for innovative teaching and research. Dr Karin clinical associate professor and Dr. Lorraine Alexander associate professor and distance learning director delivered knowledge through video lectures, reading material was provided, article link were shared for further access. Intermittent quiz were conducted for timely evaluation. It's a six week course which covered concepts of epidemiology and its studies.

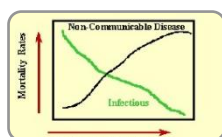
Key Learnings:



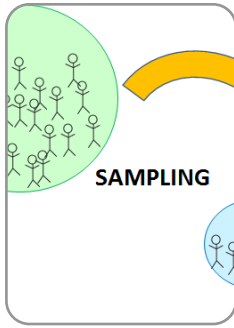
Epidemiology study is the study of close association between disease, host, vector, environmental factors and agent



Use of epidemiology in maternal and child health, health policy planning and implementation, disease surveillance



Epidemiological transition from infectious disease to resurgence of infectious disease and high prevalence rate of chronic diseases due to sedentary lifestyle.



Sample size selection plays a very crucial role in policy making, Implementation and evaluation. Human errors take place while considering sample size. Emphasis should be given more on random selection



The magnitude of health and disease problem in human population, etiology factors associated with pathogenesis of diseases and helps in planning, implementation and evaluation of services for prevention, control and treatment of disease by providing essential health data



The epidemiological data is collected but the data is not used effectively in bringing efficient changes. Lot of data remains as it is and is not analyzed for further planning and evaluation. Software's should be further developed for faster analysis



Lot of human resource, time and money is utilized in conducting epidemiological studies. Emphasis should be given on minimal input and maximum output and digital system should be used for data entry to save resource and minimize human error