Part I Basic Sciences Related to Community Medicine

CHAPTER

1

Concept of Health and Disease, Ethics in Medicine and Doctor–Patient Relationship

In community medicine, 'patient' is 'community'
"Analysis of healthcare problems of community is one of the most effective ways of competency based learning in community medicine"

"A teacher can never truly teach unless he is still learning himself. A lamp can never light another lamp unless it continues to burn its own flame. A teacher who has come to the end of his subject, who has no living traffic with his own knowledge, but merely repeats his lessons to his students can only load their minds. He cannot quicken them. Truth not only must inform, but also must inspire. If the inspiration dies out, and the information only accumulates, then truth loses its infinity."
—Rabindranath Tagore

The following four part saying is about knowledge and self-knowledge:

- *He who knows not, and knows not he knows not, is a fool; shun hin*
- *He who knows not, and knows he knows not, is simple; teach him.*
- *He who knows, and knows not he knows, is asleep; awaken him.*
- *He who knows, and knows he knows, is wise; follow him.*

—Bruce Lee

COMPETENCY BASED LEARNING IN COMMUNITY MEDICINE

In the subject of community medicine, the new MBBS regulations identified 20 broad topics with 107 core competencies. Out of these, 89 (83%) are related to domain of knowledge (knows and knows how) focusing on didactic learning, while 18 (17%) are related to skill domain (shows and shows how and performs) focusing on skill learning. At the end of the course, student should be able to demonstrate and/or perform these skills himself or herself. Building these skills in community medicine is an enormous task and a challenge indeed.

New regulations give an impetus to improved doctor–patient relationship and acquisition of effective communication skills. They encourage self-directed learning by choosing a subject of interest by the learner and exposure to clinical experience in the very first year of the MBBS course. Clear directions are there for integrated teaching by way of horizontal and vertical integration. Learning is outcome based under new regulations. Specific core competencies to be acquired, span over the years. Domains of learning, methods of learning as well as methods of formative and sumative assessment have been explicitly stated.[1]

Suggested Methods of Aquisition of Various Competencies

In community medicine "the patient" is "the community" not an individual, hence the focus of learning should be: '**Community diagnosis** and **Community therapy**'. To arrive at community diagnosis, the student should be able to **listen** to chief complaints of community, directly observe, interact with community, and analyse health practices, health seeking behaviours, community structure, analyse and interprets a household survey, and facility survey data, live data of surveillance, service delivery and routine health reports/data of facility. Apart from this the student should be able to identify the root causes/determinants of health problems and be able to communicate effectively with community and organized listening groups. Some of the methods of active and participatory learning are being explained in this chapter. The teacher acts as a facilitator and provides learning material to learner.

Revised curriculum provides a unique opportunity to medical faculty of 596 Medical Colleges to restructure their teaching program, to develop learning resource material, promote problem-based learning, prepare relevant case studies, integrate teaching and learning with healthcare delivery system, use real life situations and live data, exploit modern technologies, develop field practice areas to bring field experiences to classroom setting, involve program officers of state/district in teaching program to achieve competency-based learning. Further, it provides an opportunity to transform conventional field visits to specific skills to be acquired with clear cut

objectives and ensuring achievement of relevant learning objectives. The pivotal responsibility of faculty is to develop positive attitude in students towards community.[2, 3]

Essential Skills for Community Medicine Practice

The most essential skills/competencies include:

1. Positive attitude of mind to work for community.
2. Ability to communicate effectively with people/patient and family on health and disease.
3. Ability to organize community or groups in the community.
4. Ability to generate resources from community.
5. Ability to elicit community participation.
6. Give responsibility to community (sanitation, birth and death registration, reporting outbreaks, maintenance of wells—chlorination of water—disposal of human excreta, animal excreta, and garbage).
7. Ability to assess community health needs.
8. Ability to meet community health needs.
9. Ability to share the health information with community.
10. Ability to lead health team and of training of community volunteers (birth attendants, health guides, *Anganwadi* workers, ASHAs, school teachers, *Mahila Swasthya Sanghs* and others).

The teachers/faculty must reinvent themselves to refine and practice these competencies.

Teaching vs Learning

People resent being taught. Nobody wishes to be taught but everyone wishes to learn and people have strong desire to learn. Emphasis should be on learning. Learning is a lifelong process. Child learning and adult learning differs. There are four ways of learning:

1. **Trial and error:** By trying for oneself (trial and error) and learning from each trial (experiential learning).
2. **Being told:** By receiving instructions either orally or in writing or by demonstration.
3. **Imitation:** By copying the actions of another person usually an instructor or a skilled person.
4. **Thinking:** By organizing one's thoughts about a topic or problem to arrive at an explanation or solution.

Best way of learning is learning by doing. Common saying is:

"I hear, I forget, I see, I remember, seeing is believing, I do, I know."

Adult learning should be problem-centered and experience-centered.

Pedagogy

The art and science of learning/teaching is known as pedagogy. It includes different teaching/training methods and technology to change the knowledge, attitude and behaviour of learner.

Curriculum: It is "a sum total of all planned educational experiences which include four components—**learning objectives**, **content areas** or **subject matter**, **instructional strategies**, **methods** of **learning** and **evaluation**."

Emphasis should be on learning. Lesson plan should include learning objectives, methods of learning, learning aids, contents, feedback and evaluation.

Pedagogic methods: Teaching technology and methods in medical education are—lecture, lecture discussion, demonstration, return demonstration, tutorial, clinical teaching, group discussion, brain storming, buzz session, problem-based learning, panel discussion, symposia, seminar, workshop, conference, convention, institute, completion of project, focus group discussion and case study methods, role play, reflection, cinema, narratives, comics, and skill lab.

Teaching aids: Include audio–visual and other aids, such as—tape recorder, over-head projector, mike, transparencies, video-tapes/cassettes, pictorials, blackboard, computer, laptop, etc.

Problem-based Learning/Participatory Learning

Education is a process to bring about change in behaviour of the students. Three domains—*cognitive* (knowledge), *affective* (attitudes) and *psychomotor* (practical skills) are the main focus of competency based medical education.

Behaviour change can be done by conventional methods of *teacher-centred training* in which the knowledge and skills are imparted to students by traditional methods of lectures and demonstrations; it is a passive process. The second method is, in which the students participate and take active part in self-directed learning. Here, the teacher acts as a facilitator. The learning here is *student-centred* and active.

At present, undergraduate medical education is subject-based teaching in various semesters. One course is not related to other. In the traditional subject-based curriculum, it is assumed that the knowledge gained in pre- and paraclinical periods will be remembered and will be transferred to illness situations. Both assumptions are unsupported. Forgetting is massive and rapid.

Cause to Effect and Effect to Cause Approach

Basic science teachers present material in *cause–effect logic,* in which they organise their own knowledge and in which most of the textbooks are written. The students as clinician have to relearn it in the *effect–cause sequence* within which clinical problems must be worked out. That is, the clinical problem start with an effect of a disease process. The student must work backwards from *effects* through possible explanation to identify what is likely to *cause*. This can be best achieved by integrated curriculum and integrated teaching. Various techniques have been used

to have integrated curriculum, like *system-based learning*, *community-based* and *problem-based learning*.

Problem-based learning is defined as learning that results from the process of working towards the understanding or evaluation of a community health problem. Problems are used as spring board for learning. The health problem is encountered first. It serves as a stimulus for the application and development of **problem-solving skills** and search for **knowledge** to understand the mechanisms (root causes) responsible for the health problem and its solution. The process involved facilitates self-directed independent learning. Once the information has been gathered, digested and understood, the knowledge obtained can be used to solve other problems. The key features of problem-based learning are:

1 Analysis of healthcare problems in community as main method of acquiring and applying knowledge.
2 Self-directed lifelong learning.
3 Use of small tutorial groups.
4 Develop an epidemiological reasoning process.

The problem-based learning creates an atmosphere which encourages active participation, emphasizes the personal nature of learning, accepts the differences between the learners, recognizes the learner's right to commit mistakes, tolerates imperfection, encourages openness of mind and trust in self, facilitates discovery, puts emphasis on self-evaluation and accepts confrontation of ideas.

Problem

The problem selected should be major public health problem. The entire subject may be taught on the basis of problems.

a Problems are presented to the students as written cases or live simulations or actual cases.
b The students analyse these problems and discuss these problems and generate issues which may be basic or clinical.
c These issues are framed into objectives of learning by the students.
d The teacher has a list of learning objectives for that health problem with him. He helps the students to identify the objectives of learning by themselves.
e The students seek the information from library, books, journals and resource persons in different disciplines in the college and wards of the hospitals.
f In subsequent tutorials, the students appraise the information; share it with other students in the group and discuss all aspects of the problem. They critically evaluate their own performance.
g Once the students and tutor are satisfied that the pre-determined objectives have been met, the students write down the summary of discussions. Later on other problems are taken up in the same sequence.
h *Assessment:* The evaluation of students performance is based on their achievement of the programme objectives and their performance in problem-based learning exercises, self-evaluation, peer evaluation and the evaluation by the tutor. Objective-structured clinical examination (OSCE) and objective-structured practical examination (OSPE) and special exercises can be given for evaluation of competency-based learning.

(*Source:* Souvenir-Diamond Jubilee celebration, MCI)

Recently, MCI (2018 Regulations) has revised the curriculum of UGs wherein horizontal (elements in the same phase) and vertical (elements from other phases) integration of teaching and training have been structured.

MCI has been replaced by National Medical Commission in 2020.

Clinico-social Case Review (CSCR)

This is yet another method to learn and comprehend the natural history of disease and effective interventions (levels of prevention).

This approach has two distinct components. One—the clinical review—which consists of standard case management (history taking, examination, clinical diagnosis, confirmative diagnosis, treatment, counselling and follow-up). This is best done by treating physicians and their teams in the outdoor or indoor set-up. Objective here is to treat the illness and reduce its prevalence.

Second part is social review: Social review essentially consists of identification of specific *social factors* and their analysis in respect of presenting *disease* with the *objective*:

a To *recognize* the *sufficient causes* or risk factors or underlying determinants of presenting disease.
b To *treat* the *cause* by effective intervention in order to prevent the disease, reduce its incidence, prevalence and ultimately elimination of disease.

The social review thus begins with a *disease* and searches for its *causes* which are often *multiple*—host factors, environmental factors and factors relating to causative agent of disease (multifactorial etiology).

Example: **Host factors**—age, sex, habits, personal hygiene, marital status, age of marriage, birth interval, migrant worker/labourer, social class (determined by income, education, housing and occupation), immunity and heredity may predispose a person to an illness.

Social and Cultural Factors/Practices of Host

Similarly, use of tobacco, harmful use of alcohol, physical inactivity, high speed driving and not obeying traffic rules (unhealthy lifestyles), unprotected sex with multiple sex partners (lifestyles), non-utilization of available health services or delay in seeking care, incomplete treatment, faulty choice of food—junk food, fast food, inadequate food, delayed initiation of breastfeeding, and weaning, large-sized family, lack of information and knowledge, wrong beliefs and

attitudes, are other factors which could initiate a disease, help in its progression or precipitate a disease or an event. Many harmful cultural practices may worsen a disease.

Environmental Factors

- Unsafe environments, such as unsafe water, indiscriminate defecation, soil pollution, air pollution, overcrowding, urban slums, breeding of mosquitoes, flies, rodents, insects, presence of stray dogs, animals and pets, bad working environment/occupational hazards, could be sufficient causes for disease occurrence.
- Economic loss due to an illness to individual, family, community and nation and cost of treatment and care.
- Impacts of illness on individual, family, community and nation or state are other dimensions of CSCR.

In essence, social and cultural factors have their significant role in either initiating a disease, its progression, recovery or cure.

Example: Inadequate breastfeeding and delayed weaning initiates malnutrition in young children, and an episode of diarrhoea in malnourished child precipitates malnutrition. Girl child or lesser child is predisposed to malnutrition.

Causative Agent Factors—see Chapter 7

A CASE STUDY ON CLINICO-SOCIAL CASE REVIEW

Clinical Review

A low birth weight (1.8 kg) male baby was born to Maya at first referral unit. Baby could not suck the breast milk and expressed milk was given to this baby by nurses. Baby was kept with mother for 10 days when the breastfeeding got established and baby started thriving on breastfeeds. Thereafter, the mother and baby were sent home. This baby started having episodes of cough and difficult breathing requiring hospitalization on two occasions. At the age of 10 months, the hospital admission was on account of difficult and fast breathing and the child recovered after 7 days time and sent home after counselling. The baby was due for measles vaccine and this opportunity was missed in the hospital. Weight-for-age at the time of discharge was 6 kg.

Social Review

Maya was lesser child and most of her time got spent in care of younger brother and sister and household chores. She could not be enrolled in school and got married around 16 years of age, she looked very weak and pale, and got easily tired after household work, became pregnant after 2 months of marriage. She had to work in farm and family, to bring fodder, fuel and cook meals. *Anganwadi* worker registered Maya as pregnant women around fifth month and this family was identified as below poverty line family, but Maya could never go to *Anganwadi* because she was too much occupied. Similarly, antenatal care visits to sub-centre located at a distance of 2 km could not happen. At last, Maya was brought to sub-centre with swollen face and legs with labour pains. Female health worker with the help of ASHA arranged free transport up to first referral unit (FRU). Free medicines and material were provided at FRU for safe delivery and incentive money was given to Maya from funds under *Janani Suraksha Yojana* (JSY) under the umbrella of National Rural Health Mission.

Several issues can be identified out of this clinical-social case review, such as girl child—the lesser child, deprivation of education to girls, undernutrition, age of marriage and teenage pregnancy, workload, anaemia in pregnancy, toxaemia, below poverty line family, health seeking behaviour, incentives for safe delivery, missed opportunities, causes of low birth weight babies, breastfeeding and management of low birth weight babies, weight gain pattern in low birth weight babies, etc. It could be a part of problem-based learning and learning of epidemiological methods.

These reviews can be an opportunity for vertical *integrated teaching* by the departments of paediatric, obstetric and gynae and community medicine, to identify causes of low birth weight and occurrence of repeated episodes of illness in young children as also integrated management of childhood illness (IMCI) apart from gender disparity.

Competency addressed: The student should be able to:
CM 1.2: Define health and describe the concept of holistic health.

CONCEPT OF HEALTH AND HOLISTIC HEALTH

SDG-3 "Ensure healthy lives and promote well being for all at all ages". WHO at 70 has chosen the theme of world health day on 7 April 2019 'universal health coverage: everyone, everywhere'.

There is renewed focus on the "One Health" which proposes to take measures to protect the health of animals, environment and humans.

"Health should be seen and believed as development function." Health is difficult to define but easier to understand. To many of us, it may mean absence of disease or infirmity and to many it may mean sound body and sound mind and sound function of the body: A concept close to holistic health.

'**Holistic health**' can be **defined** as an approach to life. Rather than focusing on illness or specific parts of the body, this ancient approach to **health** considers the **whole person** and how he or she interacts with his or her environment. **Holistic health** emphasises the connection of mind, body, and spirit.

ATTAINING HOLISTIC HEALTH

Well-being is made up of physical health, social and emotional nurture, mental stimulation, focus clarity and spiritual nourishment. Therefore, in order to feel at our very best we need to start a holistic self care path to create a personal well-being plan. Start by categorising the physical, mental, emotional and spiritual parts and then choose one or more activity that will serve you in the most enjoyable and meaningful way.

For example

Physical—a daily 45 minute walk

Mental—commit to a 15 minute morning meditation

Spiritual—rediscover a passion, interest or hobby by making time to incorporate in your week. 'India is a Centre of World Holistic Healthcare'—"PM Modi".

"Good health is the most precious thing anyone can have. When people are healthy, they can learn, earn, work and support themselves and their families. When they are sick, nothing else matters (Dr Tedros Adhanom Ghebreyesus WHO Director General 2019)".[4]

To an anatomist: Healthy body means it should confirm to normal anatomical structures.

To a physiologist: Health means normal body functions.

To a biochemist: It means normal biochemical levels/values.

To a pathologist: It means normal cellular make-up.

To a geneticist: It means full realization of genetic potential.

Similarly, to a clinician it means no abnormality in structure and function and usually when a clinician fails to detect anything in a person by his clinical wisdom and laboratory tests, he/she labels a person no abnormality detected (NAD).

To a psychiatrist: It means well adjusted and a balanced personality.

Definition

World Health Organization (WHO) has given a comprehensive definition of health which includes important dimensions, such as physical, mental and social health. WHO in its constitution has defined health in the largest sense of the term that states:

"**Health** is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." WHO's 199 member states have endorsed this statement.[1] The Executive Board of the World Health Organization (WHO) proposed redefining 'health' as "a dynamic state of complete physical, mental, social and spiritual well-being, and not merely the absence of disease or infirmity" (WHO 1998).

WHO recognizes "health as a fundamental human right of an individual, family and community and it sets a most important social goal of the enjoyment of highest attainable standard of health by all nations or countries "without distinction of race, religion, political belief, economic or social condition". Realization of this goal requires the action of many other social and economic sectors in addition to health sector. Health is thus a multisectoral subject. Inter- and intra-sectoral coordination is essential to achieve the goal of health for all.

"One health" has been defined by WHO as "an approach to designing and implementing, programs, policies, legislations and research in which multiple sectors communicate and work together to achieve better public health outcomes".

In the international conference on primary healthcare jointly organized by the WHO and UNICEF in Alma Ata, USSR, in September 1978, fundamental principles of health were enunciated and a declaration was made; this declaration endorsed the earlier resolution of 30th World Health Assembly (1977).

"The attainment by all citizens of the world by the year 2000 of a level of health, that will permit them to lead a socially and economically productive life."

This is popularly known as 'Health for all' (HFA) and it is to be achieved through primary healthcare approach, in a spirit of social justice and as a part of overall development. Development of health is to be based on self-determination and self-reliance in health on the part of individual, the community and the nation. Ottawa Charter (1986) further lends support to health promotion.

DIMENSIONS OF HEALTH

There are three dimensions of health: *Physical, mental* and *social*. A fourth dimension of *spiritual health* has been added.

Physical Well-being

It means adequate body weight, height and circumferences as per age and sex with acceptable level of vision, hearing, locomotion or movements, acceptable levels of pulse rate, blood pressure, respiratory rate, chest circumference, head circumference, and waist–hip ratio. The body structures and functions confirming to laid down standards within the range of normal development and functions of all the systems. Some of the physical health standards are:

- Birth weight should range between 2.7 and 2.9 kg 'cut-off' level of low birth weight is 2.5 kg.
- Standard growth charts have been evolved to monitor growth of young children.

Body mass index: Normal range is 18.5–25 and waist–hip ratio normal range is 0.6–0.9 and triceps skinfold thickness 12–15 mm and sub-scapular skinfold 18–20 mm.

Similarly, ideal weights as per age and height for male and female have been worked out. Reference Indian adult man and woman have been defined.

Reference Indian Adult Man and Woman (NNMB)

Reference man is in age group 19–39 years and weighs 65 kg with a height of 1.77 m with a BMI of 20.75 and is

free from disease and physically fit for active work; on each working day, he is engaged in 8 hours of occupation which usually involves moderate activity, while when not at work he spends 8 hours in bed, 4–6 hours in sitting and moving about, 2 hours in walking and in active recreation or household duties.

Reference woman is in age group 19–39 years, non-pregnant non-lactating (NPNL) and weighs 55 kg with a height of 1.62 m and a BMI of 20.95, is free from disease and physically fit for active work; on each working day she is engaged in 8 hours of occupation which usually involves moderate activity, while when not at work she spends 8 hours in bed, 4–6 hours in sitting and moving about, 2 hours in walking and in active recreation or household duties.

Reference Body Weight and Height

Reference body weights and heights of Indians as under physical health are easier to understand and easier to measure. Periodical health examination and pre-placement health examination determine the level of health of an individual. We want best of physical health standards to be attained by all individuals and we are most particular for recruitment in army for physical standards apart from mental health.

Mental Well-being

The positive dimension of mental health is stressed in WHO's definition of health as contained in its constitution.

Mental health is defined as "a state of well-being in which the individual realizes his or her own abilities, can cope with normal stresses of life, can work productively and fruitfully and is able to make a contribution to his or her community".

A mentally normal person has the ability to mix-up with others, he/she makes friendship, behaves in a balanced manner, keeps himself tidy and observes adequate personal hygiene, well oriented to time, place and person and environments and is unduly not suspicious of others, he is cheerful and happy and enjoys life with a purpose and he thinks positively and has normal development and contributes fully and is useful and productive to society and nation. He/she is a balanced person and emotionally stable and realizes his/her shortcomings and strengths and abilities. People are judged by others. The friend circle or family members are the one's who can endorse the mental health status of an individual first of all.

Social Well-being

It is third dimension of health. It means ability of a person to adjust with others in his social life, at home, at work-place and with people. Men interact with men and they inter-relate and interdepend on each other and play their effective role in accordance with a situation. Essentially, social well-being includes harmonius inter-relation and interaction of human beings.

Social well-being is a composite function of **income level, literacy, occupation** and working conditions, marital harmony, institution of family, social groups and cultural and behavioural pattern of the society and stressful situation. Social well-being is conditioned by the influence of environments as well. Social well-being can be measured on a scale by taking into consideration indicators like income, literacy and occupation (as discussed under socio-economic status of family).

Competency addressed: The student should be able to:
CM 1.2: Describe the concept of **spiritual health**.

Spiritual Well-being

The WHO at its 37th World Health Assembly has added the spiritual dimension to health. The recognition of this dimension speaks of the importance of multidimensional well-being of *swasthya* (health).

Spiritual health has been defined as "that part of the individual which reaches out and strives for meaning and purpose in life. It includes integrity, principles and ethics, the purpose in life, commitment to some higher beings and beliefs in concepts that are not subject to the state-of-the-art explanation".

Positive health: A person who enjoys all the four dimensions of health (physical, mental, social and spiritual) is said to be in a state of positive health. The concept of perfect positive health cannot become a reality because a person can never be in perfect state of all the four dimensions.

Medical Classification: Officers

Health of serving officers is continuously monitored through periodical medical check-ups during the entire length of their service. Similarly, periodical medical examination of industrial workers is done regularly.

Medical Classification

Medical classification of serving officers is done by medical board after assessing his fitness under five factors, indicating by the code word 'SHAPE' which represents the following factors:

- **S** Psychological
- **H** Hearing
- **A** Appendages
- **P** Physical capacity
- **E** Eyesight

Medical classification under the system is based on functional capacity of the individual as a whole for military duties. Thus, classification done under this system enables the administrative authorities to assign appropriate assignment to officers depending upon their employment capacity. Functional capacity of an officer under each factor is denoted by numerals 1–5 against each code letter, indicating declining functional efficiency. The numerals

are written next to the code letter, except that where an officer is in grade 1 in all factors, his categorization may be denoted by writing SHAPE-1 instead of writing S1 H1 A1 P1 E1. General evaluation of numerals is as under.

1 Fit for all duties anywhere.
2 Fit for all duties but may have limitations as to type of duties of employability. Employment restrictions are given separately by the medical board.
3 Excepting for 'S' factor fit for routine or sedentary duties but may have limitations of employability at high altitude (above 2700 meter), extreme cold area/ hilly terrain and for lone assignments for which specific recommendations are given.
4 Temporary unfit for military duties on account of hospitalization/sick leave.
5 Permanent unfit for military duties.

Competency addressed: The student should be able to:
CM 1.1: Define and describe the concept of **public health**.

CONCEPT OF PUBLIC HEALTH

I. Public Health

- Winslow defined **public health** as "the art and science of preventing diseases, prolonging life, and promoting health through organized community efforts and informed choices of society organizations, public and private communities, and individuals."

  It means organizing healthcare systems, resources and infrastructure. Health management is an example of public health.
- WHO and Acheson report defined **public health** as, "the science and art of preventing diseases, prolonging life and promoting health through organized efforts of society."
- Focus of public health is total population (healthy and sick both).

How to Achieve Goal of 'Health'?

Public health system achieves goal of health by:

1 **Providing organized health services** (promotive, preventive curative and rehabilitation services)
2 **Promoting healthy behaviours** and lifestyles (universal exclusive breastfeeding, handwashing, physical activity and avoid tobacco and alcohol).
3 **Promoting healthy environments** (household and external) water supply and sanitation, prevent indoor and outdoor air pollution, accidents and mosquito breeding or vector breeding.
4 **Implementing health legislations** against tobacco use, food adulteration, epidemic/pandemic, etc.

II. Concept of Preventive Medicine

"It is the science and art of preventing diseases, prolonging life and promoting health".

Generally the preventive medicine focuses on individual health or groups, such as high-risk groups and advocates screening of high-risk groups/individuals. The concept can be extended to general population. This term and concept became popular in the United States of America.

In India we adopted the term of 'social and preventive medicine' or 'preventive and social medicine' and subsequently the term 'community medicine' has been adopted.

III. Concept of Social Medicine

"Social medicine is the study of socio-economic, cultural, environmental and health services and genetic factors and conditions which influence the health of population". This term and concept became popular in United Kingdom during the industrial revolution.

IV. Community Medicine/Community Health

Last JM defined community medicine as "the field concerned with the study of health and disease in the population or a defined community or group. Its goal is to identify the health problems and needs of defined populations (community diagnosis) and to plan, implement and evaluate the extent to which health measures effectively meet these needs".

The Ottawa Charter (1986) is the pivot of principles and practices of health promotion. It recognizes the fundamental conditions and resources for health—peace, shelter, education, food income, a stable ecosystem, sustainable resources, social justice of equity. The Ottawa Charter on health promotion advocates five key strategies:

1 Building healthy public policy
2 Create supportive environments
3 Strengthen community action
4 Develop personal skills
5 Reorient health services.

Competency addressed: The student should be able to:
CM 1.2: Define and describe the **relativeness of health**.

RELATIVENESS OF HEALTH

Health is a relative phenomenon. It is biological 'normal' state based on statistical norms/standards. The use of reference values to diagnose or screen for disease implies that health is relative concept. Clinical examination, evaluation of laboratory data and diagnostic imaging findings all require comparison to 'normal' standard. Normality itself is also relative. Very often normal values differ between geographical areas, between sexes or age groups. For example, 'normal' blood pressure differs between sexes, and also varies with age and its pattern is not the same in all human populations. A statement of normal values must indicate the population referred to similarly, pulse rate, heart rate, height, weight, serum

cholesterol and haemoglobin levels vary from person to person. The establishment of 'normal' values permits the selection of appropriate actions in medical practice.

Variability is inherent in biomedical measurements upon which decision on individual patient care or community health programmes are based. It is therefore necessary to establish **standards** on which decision can be made. These standards are often referred to as **normal values** and are generally based on measurements made on **healthy** population in statistical reasoning. What occurs most frequently is considered as **normal**. The problem is often where to draw a cut off line between **normal** and **abnormal**.

Two types of normal values are usually required for medical decisions:

i **Point normal** values, and
ii Normal **range**

- Point normal values are derived from population/ sample mean values (mean, median or mode).
- Normal range in medical sciences is as mean ±1.96 SD, which ensures 95% of randomly selected healthy people would fall within the limits in a normal distribution. It is easy to compute normal range in term of the mean and standard deviation by using the property of normal distribution.

Competency addressed: The student should be able to:
CM 1.2: Define and describe **determinants of health**.

DETERMINANTS OF HEALTH

Determinants of health are underlying causes of ill-health and development. These are—"the **causes** for the **causes**" these can be addressed by collective action across multiple sectors—health, education, nutrition, water and sanitation, poverty reduction, etc. 'Health in all Public Policies' and healthy public policies can be effective interventions.

Health is a development function. Much more health comes through sectors other than health sector, such as water and sanitation (environments) nutrition, literacy women and child development and healthy lifestyles (behaviours). These are also known as determinants of health. Hence, integration of health services with determinants of health achieves better health. The National Health Mission adopts a synergistic approach by effective integration of *Health* concerns with determinants of good health, viz. *nutrition*, *sanitation*, hygiene and safe drinking water through district action plan for health.

1. Environment

This is considered to be the most important determinant and input to health. The environment is defined as "the aggregate of all external conditions and influences affecting the life and development of an organism, human behaviour and society". A composite of physical, economic pressures, culture and education contributes largely to the background to which one's genetic apparatus reacts. Harmonious environment relationship to man contributes to an improved state of health (Fig. 1.1).

Rightly so the national health planners have included in their agenda to control and improve the natural physical environments, e.g. **air, water, soil, and noise**.

Man-made Environment

In man-made environment or artificial environment included items are **housing, transport, industries** and **communication** (roads, rail, air and sea).

Environment forms the fulcrum in the chain of transmission (epidemiological triad) as shown in Fig. 1.2. There is continuous interaction between agent, host and environment:

Agent ⇄ Environment ⇄ Host.

If there is an equilibrium between agent, host and environment, the balance is maintained and the individual, family and community enjoy perfect health. If the environments become favourable for agent (disease producing stimulus/factors/conditions/microorganisms) the balance is tilted, health is disturbed and the result is disease or bad outcome. Treating and modification of environments favourable to human host promotes health and prevents diseases.

Over 80% of diseases are due to bad environments like unsafe water supply, wide spread insanitary conditions due to indiscriminate defecations, poor disposal of waste water, garbage and refuse apart from air pollution leads to wide spread filthy conditions and are perpetual threat to endemic diseases and outbreaks. Mosquitoes and fly breed enormously and pose threat to occurrence of several diseases. Environment is a global concern and all energies are now focused to save the planet (our earth) by improving the deteriorating environments. While talking of environments, community treatment has been successful by handling the environment by three methods:

i *Socio-economics (poverty):* The term social and economics although susceptible to different definitions are completely interdependent in relation to environment. Economic life is chief determinant of social existence, hence the term socio-economics. The poor governments do not have enough money and so are the people of that government. *Poverty affects* the health in that productivity is lost due to partial disability. There is vicious circle because *people are poor as they are sick and sick because they are poor.* However, the high economics does not always assure good health. They may purchase things which impair health.

ii *Wealth distribution (employment):* Remunerating jobs, freedom from unemployment provides for improving living standards which in turn can help provide personal and environmental health, these are considered purchasable commodities. Wealth ensures

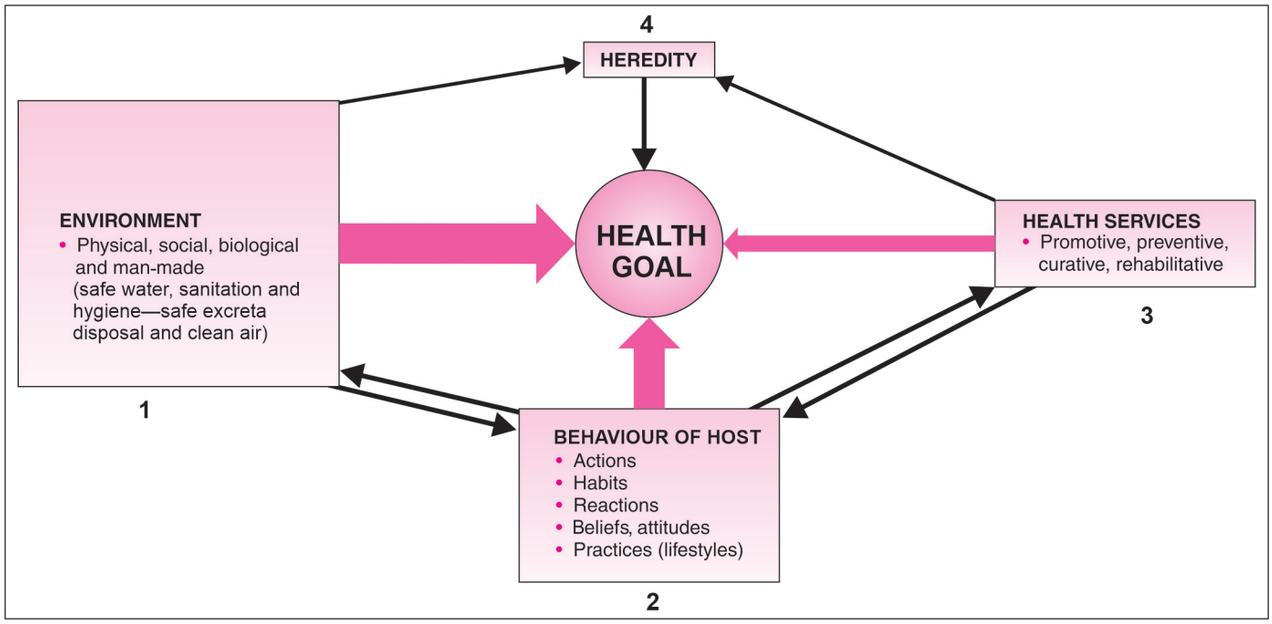

Fig. 1.1: Determinants of health (WHO*)

*The direction of the arrow indicates the direction of impact while the width of the arrow indicates the relative weight or importance of the input to health (WHO). "One health approach": Focuses on measures to protect the health of animals, environment and humans.

good housing facility, nourishment, clothing, recreation, good use of leisure, and all these contribute to health.

iii *Education:* Besides socio-economics education is another variate for contribution to health. Educational progress conditions biological, domestic and technical progress. Its positive contribution to economic growth including health is recognized by all. Planning for education is thus considered planning for health and vice versa. 'Education for all' and universal elementary education are the thrust areas which will contribute substantially to improved health for all including environments besides **health-seeking behaviour.**

iv. *The Environment (Protection)* Act of 1986 is an Umbrella Act for the *protection of the environment*. Relevant to the water environment, this Act has among others the following features:

- Nationwide programme for prevention, control and abatement of environmental pollution.
- Empower any person to enter, inspect, sample and test.

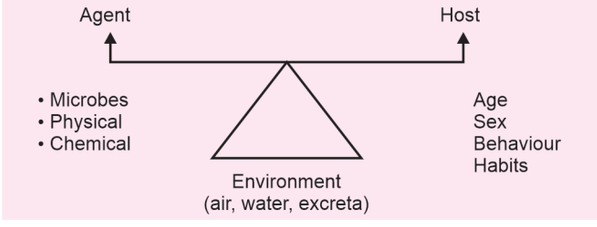

Fig. 1.2: Characteristics of agent, host and environmental factors

- Establish/recognize environmental laboratories.
- Regulate, close, prohibit industries, processes, and operations.
- Require Government organizations to furnish information, etc.

The Central Pollution Control Board (CPCB) is the national apex body for assessment, monitoring and control of water and air pollution. Well-managed and integrated water and sanitation programmes are crucial to health and development. A clean environment and adequate safe water are essential prerequisites for all children to grow, develop and attain good health. There is now distinct change in the strategy for promoting sanitation by the government. The Central Rural Sanitation Programme now promotes sanitation as a seven-component package: Handling of drinking water, disposal of waste water, disposal of human excreta, disposal of garbage and animal excreta, home sanitation and food hygiene, personal hygiene and village sanitation. Investments for ensuring access to safe drinking water will bring the desired health benefits only when complemented by investment in all the seven components of sanitation.

A staggering 29% of Indians defecate in open risking the environments and leaving the excreta to seep through the soil and contaminate the water table and water bodies with pathogens which come back into food chain. This is a key causative factor behind the high prevalence of soil and waterborne diseases in rural India as also in urban slums. According to World Health Organization, 80% of all diseases, such as diarrhoea, cholera, typhoid fever

infective hepatitis, vector-borne diseases, etc. are caused due to lack of safe water and sanitation.

END OPEN DEFECATION BY 2030

As per UNICEF 2020 data, 71% of households have toilets. This percentage is lower in villages where 67% use toilet (Table 1.1). Total sanitation campaign (TSC)/ **Swachh Bharat Abhiyan** (Gramin and Urban) is a sound beginning. Its objectives are to bring about improvement in the general quality of life in rural areas, accelerate sanitation coverage and generate demand for toilets in all schools and *Anganwadis* in rural areas through awareness and behaviour change through education involving Panchayati Raj Institutions (PRIs). *Nirmal Gram Puraskar* a National Award under total sanitation campaign has been launched on Feb. 24, 2005 by the Government. PRIs can look forward to get cash prizes ranging from 50,000 to 5,00,000 if:[5–7]

- All households in the village have access to toilets with full usage.
- There is no open defecation.
- All *Anganwadi* centres have access to sanitation facilities.
- There is general cleanliness all around.
- Kerala is the first state to end open defecation.
- India was declared open defecation free in Oct 2020.

Table 1.1: Households basic sanitation services 2021

Country	*Improved sanitation coverage (%)*		
	Urban	*Rural*	*Total*
China	95	88	92
India	79	67	71
Iraq	100	100	100
Pakistan	82	60	68
Sri Lanka	93	94	94
World	**88**	**66**	**78**

Environment being Compulsory Subject

50 hours compulsory core module course in *Environmental studies*, spread over to 6 months, at undergraduate level in all streams has been introduced by various universities in view of direction of the Hon'ble Supreme Court of India; with effect from 2004 to 2005. This course will enhance knowledge, skills and attitudes to environment. The syllabus is divided into eight units covering 50 lectures including field work activities of five lecture hours.

2. Behaviour of Host (Fig. 1.1)

i It is considered second largest area or determinant/ input to one's health and at some places it is even higher than environment. Like most personally held values and beliefs, certain habits are first learnt from family, community and school, all of these play an important role in general behaviour pattern. In terms of satisfactory survival, one's behaviour may not be the most rational and will therefore require modification through effective behaviour change communication (BCC) in most of non-communicable diseases.

ii Each society and indeed individual has cultural values, ideologies and interests relating to health and health services. The beliefs inimical to survival indicate need for health promoting changes in cultural pattern. But it may also be determined whether such changes are desirable or even tolerable. Behaviour change communication is to create healthy lifestyles, healthy habits, responsible reproductive behaviour, values of traditional and indigenous foods, safe sex and practice of personal hygiene to promote health and prevent diseases. Proper evaluation of beliefs, social values and motivation should determine the needed changes and in which way the services are to be provided to be acceptable.

iii Attitude change is a major change and may bring about permanent behavioural change (feeding young children, promotion of universal exclusive breastfeeding, feeding and eating habits—a core cultural variable, adequate diet for physical and mental alertness).

iv Primary values are respected and self-image is not destroyed.

v Geographical social mobility and dissatisfaction foster change.

vi Attitudes are also related to utilization of services provided. Even for the existing services, the utilization rates are low at 50% or even less for antenatal care, use of iron and folic acid and vitamin A prophylaxis.

vii ***Habits (habit means repetitive behaviour in an individual):*** Habits die very hard. In the word 'HABIT' if you remove 'H' ABIT of it is there, if you further remove 'A' BIT of it is there, if you remove 'B' IT is still there. Habits do not change by sheer will power. It demands change in beliefs and attitudes and it requires practice and skills.

3. Health Services

Availability, accessibility, affordability and acceptability of health services are considered an important determinant/ input to health. Health services utilization depends on quality of services offered as also faith and satisfaction derived from services apart from accessibility. Health services include promotive, preventive, curative and rehabilitative services available through various health systems. Utilization of health services depends upon health behaviour and socio-economic conditions (income, literacy and occupation of a person).

4. Heredity

Genetic inheritance may provide the initial significant contribution to one's state of health, may be modified by

environments and specifically by health services. Even before individual's birth, comprehensive health planning will need to include such aspects of healthcare as prenatal counselling and prenatal care apart from marriage and genetic counselling.

Ecology of health: Ecology is defined as mutual relationship between living organisms and their environment. Ecology of health is the study of relationship between variations in man's environments and his state of health.

Social Determinants of Health[8]

Social determinants of health are the 'causes for the causes'. Social determinants of health are the conditions in and under which people are born, grow, live, work and age, and broader set of forces, and systems that shape the conditions of daily life are referred to as **social determinants** of **health** (WHO).

These include early year's experiences, education, economic status, employment and decent work, housing and environment and effective systems of preventing and treating ill health. Actions on these determinants, such as eradicating poverty and hunger, ensuring food security, access to safe drinking water and sanitation, employment and decent work and social protection, protecting environments and delivering equitable economic growth will ensure economically productive and healthy society. It requires 'Health in all policies' with action by sectors outside the purview of health to attain better health and development.

Village Health Sanitation and Nutrition Committees (VHSNC), Urban Health Sanitation and Nutrition Committes and Mahila Arogya Samiti in Urban Slums

Following the launch of revised guidelines for VHSNCs, as a part of guidelines for community processes VHSNCs are envisaged as a standing/subcommittee of the Panchayat and the role of ASHA as member secretary has been strengthened. Village Panch has been made the chairperson and VHSNC has been reconstituted. Over 5.55 lakh VHSNCs have been constituted by March 2021.

Composition of VHSNC

- Minimum of 15 members, chairperson—mahila panch—scheduled caste preferred.
- Member secretary—ASHA.
- Members: Elected Gram Panchayat members—5, ANM, AWW, school teacher, PHED, NGO members/self-help groups volunteers 10, including users of health services.

Untied grant: ₹10,000 per annum for local actions, e.g. village sanitation and reduction of breeding of mosquitoes.

Objectives VHSNC: To provide a platform for convergent actions on social determinants and all public services directly or indirectly related to health.

Convergent Actions on Social Determinants of Health

A year-long campaign—VISHWAS (**village** based **initiative** to **synergise health water** and **sanitation**) has been launched which will be conducted by each VHSNC/UHSNC in its village across all the states. ASHA will play key role in facilitating this process, but the campaign will be led by VHSNC members, and core group of volunteers from community. Eleven monthly campaigns will be conducted on selected themes, viz.

- Open defecation free village day, school and *Anganwadi* sanitation day, liquid and solid waste management, healthy lifestyles/health promotion, vectors control day—dengue and malaria, safe water and personal hygiene, integrated diarrhoea control fortnight, breast-feeding week. National Nutrition week/month in September.
- Each of these monthly campaigns days will aim at building a platform for convergence of all programmes, resources and community action on the day's theme. A manual for the campaign has been prepared. The campaign has been rolled out in October 2017. These activities are part of strategic information, education and communication (IEC) plan of Ministry of Health and Family Welfare (MOH and FW) using mass media along with mid-media, social media and inter-personal communication.

National Urban Health Mission (NUHM) envisaged a woman collective/Samiti in urban slums/slum-like settlements as a leadership platform for community level actions. As per guidelines, Mahila Arogya Samiti (MAS) has been constituted at the level of 50–100 households. MAS is expected to generate demand, ensure optimal utilization of services, increase community ownership and sustainability, and to establish community-based monitoring system. Over 62000 MAS have been formed in urban slums as part of urban health centres under NUHM.

International classification of functioning, disability and health (ICF) recognizes the role of environmental factors, more than biological or medical, in creation of disability. In doing so, it takes into account body functions and structures, activities of people, participation and their involvement in all areas of life, as well as environmental factors which affect these experiences.

Against this background, measuring or assessing individual functioning involves systemic recording and mapping of various qualifiers, facilitators or barriers in relation to impairment, activity limitation and participation restriction. The term 'capacity' refers to what an individual can do in a standard environment and 'performance' refers to what a person actually does in his/her current or usual environment. The gap between the two provides useful guide to what can be done to the environment of the individual to improve the performance. Apart from the scope of using ICF model into legislation and social policy, it has abundant application value in clinical settings for rehabilitation programming.

Rather than enlist behaviours through assessment on "what an individual cannot do", following ICF the focus has shifted to "what they can do".

Concept of Disease

The WHO has defined health, but not disease because of its variations, e.g. mild, moderate, severe, fatal, and disease without clinical manifestations. Definition, given by Webster, "A condition in which the body health is impaired, a departure from a state of health, an alteration of human body interfering in performance of vital functions".

Morbidity: Any departure, subjective or objective, from a state of physiological or mental well-being, whether due to diseases, injury or impairment.

Disease means 'lack of ease' or 'disorder of structure or function'. Disease produces specific symptoms or that affects a specific part of the body.

Examples: Fever, cough, diarrhoea, vomiting, convulsion, injury to any part of the body that may result in loss of body part or may affect the function of the body parts such as loss of vision, hearing, etc.

Extent: Overall 7.5% of people are sick at any given point of time, 6.8% in rural and 9.1% in urban areas, respectively (NSSO 75th Round 2018).

Pattern: Occurrence of disease varies by time, places, and persons.

Spectrum: Disease has a spectrum, it may be sub-clinical with no symptoms or signs or it may be early disease with mild symptoms and signs or it may be in **advance** or at severe stage with frank signs and symptoms. The outcome of disease may be full recovery with or without treatment, recovery with sequelae or disability or a person may die of fatal disease. Those who recover may become carriers of that disease (infectious disease).

Duration: A disease may be of short duration lasting for a few days less than a week or 2 weeks or it may be of long duration. A disease of short duration is called **acute disease**, e.g. acute diarrhoea fever, cough or a disease may have longer duration and we call it a **chronic disease** such as tuberculosis, leprosy, typhoid fever. Symptoms of ailment persisting **more than one month** or if a course of treatment of an ailment continuing for a month or more is called a chronic ailment. Some diseases such as diabetes, hypertension, HIV are lifelong and require lifelong continuous treatment and follow-up.

Major categories: A disease may be **communicable**, i.e. spreads from person to person or may spread by or transmitted by a vector or a common source such as unsafe drinking water or food. These diseases are caused by micro-organisms. Other categories of diseases are **non-communicable** diseases (NCDs) which are chronic in nature, expensive to treat and are caused by unhealthy behaviours or lifestyles and are multifactorial.

Measuring disease burden: Disease burden is measured by disability adjusted life years (DALYs). One DALY equals to 1 year of healthy life lost due to premature death or disability. Other measures of disease are incidence and prevalence rates, spells of sickness and duration of sickness.

Competency addressed: The student should be able to:
CM 1.3: Describe the **characteristics** of **agent, host** and **environmental factors in health and disease and multifactorial etiology** of disease.

Figure 1.2 displays the characteristics of agent, host and environments in health and disease. The detail of characteristics of agent, host and environment is described in Chapter 7 on pages 245–251.

Causes—single or multifactorial: A disease may be caused by a single agent or specific micro-organism (bacteria, viruses, protozoa, rikettsial, spirochaetes and fungi, etc.) or may result from combination of several risk factors, we call it a multifactorial disease, e.g. cardio-vascular diseases, diabetes, cancers, etc. are multifactorial (*see* pages 256, 300 and 468).

Ayurveda propagated disease theory based on 'Imbalance of Tridosha'—**Vata** (air), **Pita** (bile) and **Kapha** (mucus).

Competency addressed: The student should be able to:
CM 1.4: Describe and discuss the natural history of disease.

The natural history of any disease refers to the phases through which the disease passes, in the absence of any intervention. Clear knowledge of natural history of a disease helps in identifying the stages vis-à-vis appropriate intervention to prevent and control the disease or eliminate and eradicate a disease. The natural history of any disease begins as soon as the organism of a disease (infectious (disease) enters the body of a susceptible host or else a disease provoking stimulus or accumulation of risk factors or condition/exposure/circumstance or combination of these factors start operating in the **susceptible host**.

Pre-pathogenic phase: During this period the host stays healthy without any disease and the **agent, host** and **environment** remain in balance.

Pathogenic phase: This begins/starts as soon as the disease producing organism or stimulus enters the human body, the body of host reacts and chain of events follow as depicted in Fig. 1.3.

If the natural history of a disease is known and most probable risk factors/exposures are known then appropriate levels of prevention/interventions can be applied in healthy population or in sick persons to promote health, to prevent disease, cure disease, limit disability and to rehabilitate persons.

Competency addressed: The student should be able to:
CM 1.5: Describe the application of interventions at various **levels of prevention**.

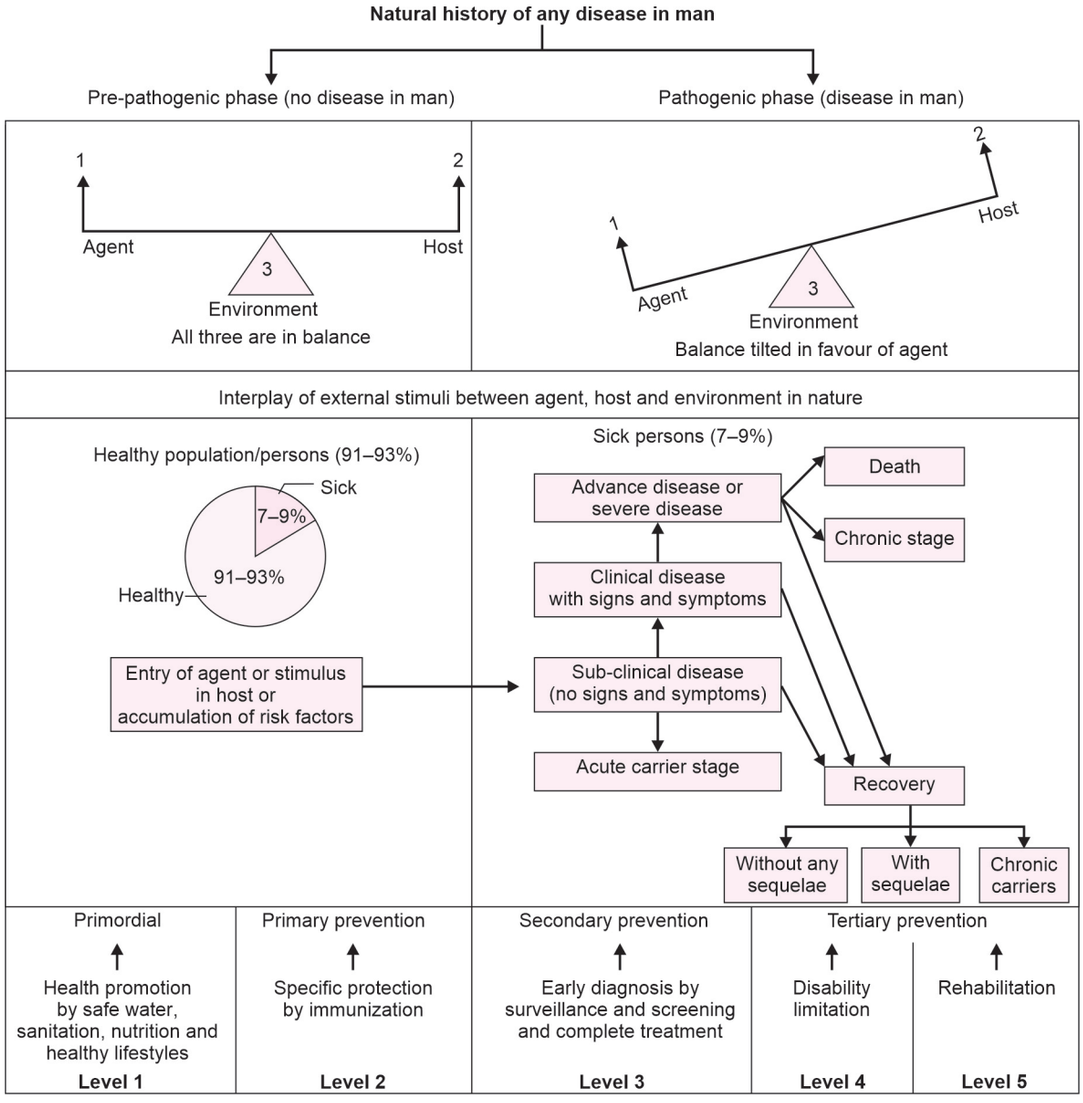

Fig. 1.3: Natural history of disease and levels of prevention

LEVELS OF PREVENTION

The word 'prevention' is derived from Latin '*praevenire*' means 'to come before'. The prevention is anticipatory medicine. It comes before the disease occurs. Anticipatory actions or proactive measures are preventive in nature. Preventive actions can be taken at any stage of the spectrum of health and disease. Most of the preventive measures are focused on 'healthy people', to ensure that they stay healthy and do not contract or develop disease or diseases. The goal of prevention is to 'achieve health for all' or 'health in all'[9] to ensure adequate level of health which permits them to lead a productive and socially useful life (Fig. 1.4).

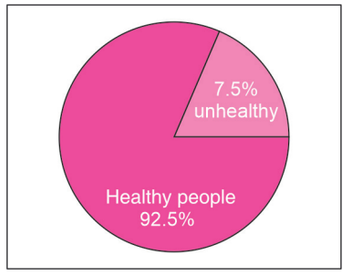

Fig. 1.4: Proportion of ailing persons in a 15 days period

Clearly, the concern and focus of prevention is on 92.5% 'healthy people' to ensure that they stay healthy but the concept of prevention can be applied to 7.5% of unhealthy

or sick also to restore their health at the earliest and to prevent deaths and disability in sick persons.

LEVELS OF PREVENTION—APPLICATION OF INTERVENTIONS AT VARIOUS LEVELS

Following levels of prevention are applicable:

1. **Primordial**
2. **Primary** → Focus on healthy people/total population
3. **Secondary**
4. **Tertiary** → Focus on sick people (who have already developed a disease)

All these levels are important and complementary, although primordial prevention and primary prevention have the most to contribute to the health and well-being of the whole population.

1. Primordial Prevention

This is the real prevention, which does not allow the people to fall sick. The goal of primordial prevention is **healthy nations, healthy population, healthy cities, towns** and **villages,** healthy homes, healthy environments, and work place.

Aim

The aim of primordial prevention is to prevent the emergence of 'unhealthy lifestyles' in population or to prevent the emergence of 'risk factors' in the community.

Primordial prevention is a *strategy* to reduce risks and promote healthy lifestyles.

In developing countries with high mortality, 10 selected leading risk factors have been identified for appropriate actions, these are:

i Underweight/malnutrition
ii Unsafe sex
iii Unsafe water, sanitation and hygiene
iv Indoor smoke from solid fuels
v Zinc deficiency
vi Iron deficiency
vii Vitamin A deficiency
viii High blood pressure
ix Tobacco use
x Cholesterol

The policy and legislation on tobacco and smoking have been adopted by many governments in the world including India. Tobacco epidemic can be prevented by effective legislation against tobacco. WHO global initiative has motivated many countries to adopt effective policy on tobacco.

People should not take onto smoking (tobacco use) or adopt unhealthy lifestyles in relation to diet, exercise, and physical activity.

The world is living dangerously either because it has little choice or because it is making wrong choices. Today there are more than 8 billion people coexisting on this fragile planet. On the one side there are many millions who dangerously face high and heavy concentrated burden from poverty, undernutrition, unsafe sex, unsafe water, poor sanitation and hygiene, iron deficiency and indoor smoke from solid fuels. On the other side lies unhealthy consumption, particularly tobacco and alcohol. The risks from blood pressure and cholesterol, strongly linked to heart attacks and strokes are also closely related to excessive consumption of *fatty, sugary* and *salty foods*. They become even more dangerous when combined with deadly forces of tobacco and excessive alcohol consumption. Obesity a result of unhealthy consumption coupled with lack of physical activity is itself a serious health risk.

India is facing a double burden of disease, i.e. infectious diseases due to lack of safe water, sanitation, and chronic non-communicable diseases due to *unhealthy lifestyles*.

Primordial Prevention Strategies

(a) At Government Level: Healthy Public Policies

The Government especially Health Ministry should play a stronger role in formulating risk prevention strategies which are population- or community-based strategies.

- Provision of safe water and ensuring sanitation to rural, tribal and urban areas (The *Swachh Bharat Abhiyan*).
- Policy on nutrition to improve nutrition by effective agriculture policy on "food for all and good nutrition for all" particularly improving the nutrition of most vulnerables: Infants, young children, adolescent girls, pregnant women and lactating mothers.
- Revised National Nutrition Policy on promotion of healthy diets.
- Controlling food industry to prevent production and sale of junk foods, salt and *trans*-fats reduction in processed foods.
- Healthy foods through mid-day meal in schools.
- **Tobacco, alcohol and substance abuse:** Tobacco of course is a major risk factor for cardiovascular diseases. In terms of intervention, the greatest tobacco-related improvements in population health would be a combination of tobacco taxation (Sin tax), comprehensive ban on advertising and restriction of smoking in public places and sale of cigarettes/bidis to children should be implemented. 'Legislations on tobacco' by all nations has been adopted in view of great health risks of tobacco.
- Policy on crop alternative to tobacco.
- Controlling/regulating behaviour of road users through Road Safety Motor Vehicle Act—licensing for driving, use of safety belts and helmets.
- Prevention of air pollution (indoor and outdoor).
- Promoting non-health sectors involvement in developing policies for control of NCDs and intersectoral coordination—agriculture, education, food industry,