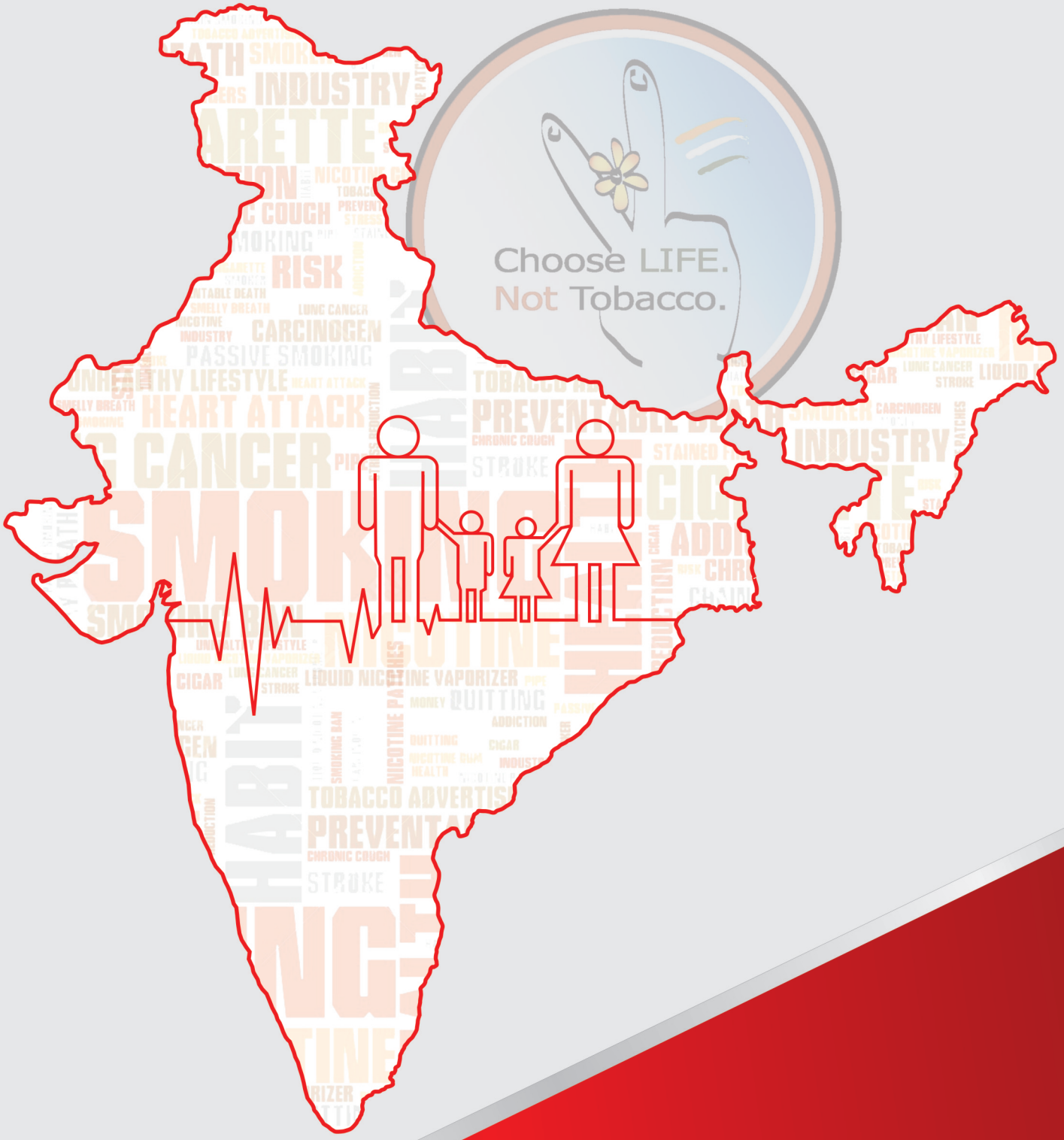

Tobacco Control

A module for Public Health Professionals

Editors: Dr. Sonu Goel, Dr. Sitanshu Sekhar Kar, Dr. Rana J Singh

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A Module for Public Health Professionals

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Tobacco Control- A Module for Public Health Professionals

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FOREWORD

Globally, tobacco use is leading preventable cause of morbidity and mortality. It is also a lead risk factor for Non-Communicable Diseases. To address this menace, Government of India enacted a comprehensive legislation 'Cigarette and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply, and Distribution) Act, 2003 and launched National Tobacco Control Programme (NTCP) in 2007-08. One of the major components of the programme is to build capacity of different categories of health workers on tobacco control. The sensitization of young and budding public health students on multiple aspect of tobacco along with building their capacity on tobacco control related aspects could help in controlling global tobacco use and promoting health.

In last decade, many Schools of Public Health were opened in medical and non-medical institutes of India. They can potentially complement and strengthen the activities of the community medicine departments by offering opportunities for public health education to both medical and non-medical graduates. It has a right mix of various public health disciplines like epidemiology of communicable and non-communicable diseases, health management, health promotion, health economics, primary health care, social sciences, women's health, child health, research methodology etc. The Masters of Public Health (MPH) students can play a key role in disseminating knowledge to people at grass root level, educating public health students, support locally relevant research, undertake monitoring and evaluation of tobacco control programmes and policies and influence policy makers by undertaking advocacy.

This Tobacco Control module for MPH students provides useful insights and knowledge about various tobacco control issues like Epidemiology of tobacco control, Tobacco use practices in India, Health and socio-economic impacts of tobacco, Risk factor approach to NCD, National and international policies and legislations, National tobacco control program, Tobacco surveillance (GATS, GYTS), Tobacco smoke-free environment, Youth and tobacco use, Tobacco cessation, Behaviour change communication and community participation in Tobacco control, Economics of tobacco control, Tobacco industry interference, Multi-sectoral approach in tobacco control, Role of civil society, Awareness generation, Endgame strategies for tobacco control and Operational research in Tobacco Control. The chapters in the module are written by eminent authors from leading organizations. The module is also an excellent resource for public health professionals, government officials and implementers, public health advocates, researchers and policy makers.

I congratulate PGIMER, Chandigarh; JIPMER, Pondicherry and The Union, South East Asia on production of this excellent module on tobacco control with help of top experts in the field. I truly hope that the module will prove to be immensely useful in achieving the objective of reducing tobacco use prevalence and diseases related to tobacco use in India.

(C.K. Mishra)

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PREFACE

The trend of tobacco use is increasing despite growing evidence of its harmful effects on health. Though all sectors play a crucial role in tobacco control, the onus comes to health sector. Because, whenever a person falls sick health system is the first point of contact. It is the moral responsibility of the health personnel to inform the health hazards of tobacco use. Health care professionals have an immense role in tobacco control activities and can play a very important role in tobacco control.

Keeping this in view, this module is written by authors who have expertise in the field of tobacco control. This module is targeted towards public health professionals, doctors, nurses, social workers and people from other backgrounds who want to contribute towards tobacco control. It deals with all aspects of tobacco control starting from epidemiology of tobacco use to end game strategies and legislations related to tobacco control in a simplistic manner.

The chapters on "Epidemiology of Tobacco Use", second Hand Smoke" and "Tobacco Use and Youth" provide an in-depth understanding of history, burden, different forms and risk factors of tobacco use."Socioeconomic implications of tobacco use" explains the socio-economic inequalities in relation to tobacco use and the relationship between the tobacco use and poverty in the context of developing countries like India. The chapter on "Tobacco Cessation" describes the different modalities of tobacco cessation in a simplified manner. The chapter on "Economics of tobacco use" describes the supply and demand side of tobacco use in tobacco control using the basic principles of economics. The chapter "Behavioural Change Communication and Tobacco Control" explains how a health professional or any individual committed to tobacco control should approach a person who is using tobacco and help him/her quit tobacco in a realistic manner. The chapters "Multi-sectoral approach in Tobacco control" and "National Tobacco Control Program (NTCP) – India" describes comprehensively the role of different sectors and, the structural and functional organization of NTCP in India.

Case studies, activities, illustrations and other pictorial representations have been provided in each chapter at appropriate places for better understanding. Each chapter is provided with unit review questions and application oriented questions for better internalization of concepts. Suggested readings at the end of chapter provide in-depth knowledge on the concept described in the chapters.

A lot has been achieved in tobacco control in India but lot more needs to be done and each of us can play a pivotal role in making India "Smoke Free" !

Editors

ACKNOWLEDGEMENT

The present publication is the result of a collaborative effort between the PGIMER, Chandigarh; JIPMER, Puducherry and The Union South East Asia. The chapters were written by eminent authors in field of tobacco control and edited by Dr. Sonu Goel, Dr. Sitanshu Sekhar Kar and Dr. Rana J Singh.

We would like to acknowledge all the authors and their Head of Institutions/ Organizations whose contributions were essential to the preparation of this unique and first-of-its kind module on Tobacco Control for Health professionals in India. Though the module primarily targets Master of Public Health (MPH) trainees but we are very sure that it will serve as a guide for all health professionals who are interested to join hands to curb the menace of tobacco use in our country.

We express our sincere thanks to Prof. Y. Chawla, Director-PGIMER, Prof. SC Parija, Director-JIPMER, and Dr. Ehsan Latif, Director-Tobacco Control, The Union for their overwhelming support and encouragement at each step of genesis of this module. We are also thankful for the financial support provided by the Bloomberg Initiative Grant through The Union South East Asia for the production of this module.

Editors

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दिनांक/Dated 14.3.2016

Message

The alarmingly growing burden of non-communicable diseases (NCDs) which collectively is responsible for about 70% of all deaths globally should no longer be neglected but dealt with squarely. Tobacco is the most preventable cause of many of these diseases. The National Tobacco Control Programme being implemented in India is a great step towards curbing the tobacco epidemic and subsequently reducing the disease burden and premature deaths in the country.

The need for having technical knowledge, disease burden, legal and social aspects etc all in one place has long been felt. It will greatly benefit the programme implementers, advocacy stalwarts, academicians, scientists etc in empowering themselves for this fight against tobacco.

This book is a great effort in that direction. I therefore congratulate PGIMER, Chandigarh; JIPMER, Puducherry and The International Union Against Tuberculosis and Lung Diseases [The Union] and experts for their contribution in compiling such an excellent module on tobacco control. This should also be widely disseminated for maximum reach.

(Dr. Jagdish Prasad)

सत्यमेव जयते

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एवं
महानिदेशक, आई सी एम आर

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MESSAGE

A 'Module on Tobacco Control' has been developed jointly by PGIMER, Chandigarh; The Union-South East Asia and JIPMER, Pondicherry targeting health care professionals especially Masters of Public Health (MPH) students and people from other backgrounds who want to contribute towards tobacco control. The module is written by authors who are leaders in their areas and have immense expertise in the field of tobacco control. This module deals with all aspects of tobacco control starting from epidemiology of tobacco use to end game strategies and legislations related to tobacco control in a simplistic manner.

Case studies, activities, illustrations and other pictorial representations have been provided in each chapter at appropriate places for better understanding. Each chapter is provided with unit review questions and application oriented questions for better internalization of concepts. Suggested readings at the end of each chapter will provide more in-depth understanding about the concept described in the chapters.

A lot has been achieved in tobacco control in India but lot more needs to be done and each of us can play a pivotal role in making India "Smoke Free".

(**Soumya Swaminathan**)

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संख्या

दिनांक

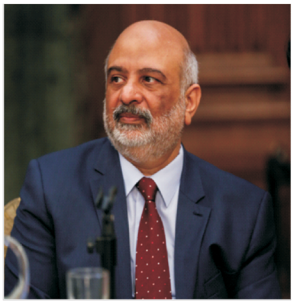
MESSAGE

Education of Young professionals on tobacco control is a key to contain the tobacco menace in the country. The tobacco control is relatively understudied and poorly practiced in medical institutions and the educational material on tobacco control is also scarce in the country.

I congratulate the Editors from PGIMER, Chandigarh: JIPMER, Pondicherry and The Union-SEA for this noteworthy achievement in bringing together the literature on various aspects of tobacco control in a comprehensive module

24.11.15

(Yogesh Chawla)



Message

Congratulations to PGIMER, Chandigarh and JIPMER, Puducherry for progressing tobacco control in the region. Increasing the capacity of human resource is the cornerstone of effective tobacco control and the efforts undertaken by PGIMER, Chandigarh and JIPMER, Puducherry in this direction are commendable. Tobacco control requires a dedicated team of advocates which understands the issues and continues to attract others to join the movement. We are certain that the module developed by PGIMER, JIPMER and Union South East Asia will assist in increasing the awareness of the need for tobacco control and of putting people's health over any perceived economic gains from tobacco trade thereby saving millions of lives.

It shall also serve to institutionalize capacity building for tobacco control in India and the region. This approach of building long term programmes and not just projects has been at the forefront of The Union's efforts and the development of this module shall go a long way to address the challenges faced by the people involved in tobacco control.

Congratulations to the team once again as we look to collaborate with the team on all aspects of tobacco control.

Dr. Ehsan Latif
Director-Tobacco Control

International Union Against Tuberculosis and Lung Disease (The Union)

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Message

As health professionals, it is our responsibility to stop and reverse the tide of increasing health and socio-economic burden caused by tobacco use among the masses, JIPMER being an Institution of National Importance is committed to work for eliminating Tobacco from this part of country and nationally. I am happy to note that JIPMER has formally integrated Tobacco into Master of Public Health course. We are committed to incorporate Tobacco into MD, UG and other allied health science curriculum, provide leadership in research and training faculty of medical colleges/institutions for capacity building.

Dr. S.C. Parija

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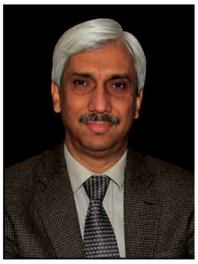
Director



राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान
National Institute of Health & Family Welfare
आरोग्यम् सुखसम्पदा

Message

Incorporating education about tobacco control measures is an integral part of effective tobacco control. The module developed by PGIMER, Chandigarh along with partners JIPMER and USEA is one such key resource material in this direction. I am certain that the module will assist in formally educating public health students across the country and also serve as a stimulating impetus for further higher education in tobacco control.

(Jayanta K. Das)

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PUBLIC
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Dr. K. Srinath Reddy
President
Public Health Foundation of India

Message

I congratulate and commend the School of Public Health, PGIMER, Chandigarh for introducing this exemplary module on tobacco control as a part ot its MPH Course. Tobacco is a serious public health challenge for the country and has assumed the dimension of an epidemic resulting in enormous disability, disease and death. This module, with contributions from distinguished experts on various aspects of tobacco control, will be an immensely valuable resource in providing insights to the students not only on the harmful effects, disease burden and related social, economic and health costs due to tobacco use but also the history, development, progression and the way forward for a scaled up tobacco control movements in India. I hope the module will help in creating an army of young tobacco control advocates who will take this fight against tobacco to the finish, promising a new era of tobacco free India in the 21 st century.

Dr. K. Srinath Reddy

Date: May 2, 2016

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Message

It is well recognized that tobacco use is the most important preventable cause of disease and death among adults in India, like in most other countries of the world. Therefore for health care professionals, tobacco control ought to be very high priority item. There is a huge amount of literature and reports on tobacco control out there but very little in the format and on specific topics that would be suitable for public health and health care professionals in India.

I am very happy to learn that through joint efforts of the Post Graduate Institute of Medical Education and Research, Chandigarh; Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry; and, International Union against Tuberculosis and Lung Disease a comprehensive module for tobacco control education has been developed for health care professionals and students. This fulfils a great acutely felt need as the professional education and educational material required for tobacco control in relation to specific Indian problems, is highly relevant for the country. It is astonishing that the use of tobacco which represents the most preventable cause of disease and death among humans, not just in India but globally, still remains a neglected topic in terms of professional education and availability of educational materials.

I therefore congratulate Post Graduate Institute of Medical Education and Research, Chandigarh; Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry; and, International Union against Tuberculosis and Lung Disease on production of this excellent module on tobacco control education with help of top experts in the field and applaud their effort.

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May 2, 2016

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Tobacco use is one of the most important public health problems in India. It is responsible for majority of the non-communicable diseases and nearly half of the cancer burden in our country. India is the second largest consumer of tobacco products in the world. It is not surprising that it is responsible for over a million deaths annually and this is expected to increase further in the coming years. Almost 35% of the Indian adults or over 280 million people use tobacco in some or the other form in our country making India the mouth cancer capital of the world.

Over 14% of the Indian youth indulge in this habit and the rising use among women and children is a matter of grave concern. Ironically, tobacco industry employs (mainly in bidi rolling and farming) lacs of women and children.

To fight the tobacco challenge we have several laws such as - The Cigarettes and other Tobacco products Act, Juvenile Justice Act, Food Act, Legal Metrology Act etc. The recent changes in the Juvenile Justice act related to strengthening of laws related to sale of tobacco products to minors and introduction of 85% pictorial warning on the tobacco products are steps in the right direction. We need proper and strict implementation of the existing laws to take the fight further.

Keeping this in view, the 'Module on Tobacco Control' which has been developed jointly by PGIMER, Chandigarh; The Union-South East Asia and JIPMER, Pondicherry targeting health care professionals especially Masters of Public Health (MPH) students and people from other backgrounds who want to contribute towards tobacco control. It has been written by professionals who are leaders in their areas and have immense expertise in the field of tobacco control. The authors have provided a comprehensive overview of all aspects of tobacco control, from epidemiology, tobacco cessation to legislations related to tobacco control. I am sure this book will be very useful for a wide spectrum of the health care professionals, epidemiologists, NGOs, and policy makers working in the field of tobacco control in our country.

With warmest personal regards,

Dr. Pankaj Chaturvedi

Mumbai 12th May, 2016

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Mr. Amit is a law graduate and currently works as a Director (Public Health, Law & Advocacy) at HRIDAY & Legal Consultant PHFI, New Delhi. He has been instrumental in advocating tobacco control issues with Govt. of India and other stakeholders.

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Dr. Arvind is currently working as a consultant in the Ministry of Health & Family Welfare, Government of India. He is involved in implementing the National Tobacco Control Programme across all States in India. His areas of interest are public health administration, non-communicable disease prevention and tobacco control.

MR. ASHISH KUMAR PANDEY

MASTERS IN PUBLIC ADMINISTRATION

Mr Ashish is currently working as a technical officer in department of tobacco control in International Union Against Tuberculosis and Lung Diseases (The Union). He has been actively advocating tobacco control since 2008. He has diverse experience of working with central governments and, national as well as international non-government organizations on public health issues including HIV/AIDS, RCH, Tuberculosis and child and women trafficking.

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MASTER IN EXTENSION EDUCATION

Mrs. Bhavna is currently working as the Chief Executive of Voluntary Health Association of India (VHAI) and is a member of several committees of Ministry of Health and Family Welfare, Govt. of India. She leads the BGI-supported VHAI Tobacco Control programme which has received WHO Regional Director's Award for outstanding contribution in Tobacco Control. Her work is primarily focused on working with legislators for policy intervention and advocacy at national and state level, implementing sustainable health and development programmes, and networking for public-private partnerships in health sector.

DR. BIJAYA NANDA NAIK

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Dr Bijaya is currently working as a Senior Resident in the Department of Preventive & Social Medicine, JIPMER, Pondicherry. His areas of interest are prevention of injury especially road traffic injury and sport injury, and non-communicable diseases.

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Dr Binod is currently working as a faculty at Dept of Community & Family Medicine, All India Institute of Medical Sciences, Bhubaneswar. His areas of interest include NCD prevention and control, family medicine practice at resource limited settings and medical education.

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Mrs Chandra is currently working as the Account Director–Advocacy and CSR at Avian Media, a leading consultancy based in New Delhi and has over 15 years of experience in communications. For the last nine years, she has worked as a Programme Manager – Development Communications and Health Promotion at Voluntary Health Association of India. She has worked with several publishing houses such as National Book Trust, Scholastic and Katha.

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Dr Divya is currently working as consultant with Public Health Foundation of India. She is involved in different projects related to tobacco control and Non-Communicable Diseases. She has been actively involved in designing various resource materials on tobacco control and conducting quantitative and qualitative research with a focus on tobacco control.

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Dr Sinha is the Regional Advisor, Surveillance (NCD and Tobacco), in WHO Regional Office for South -East Asia, New Delhi. Beside an investigators for various international scientific projects and has authored nearly 100 publications and monographs, he was part of many expert advisory groups including Million Death Study, IARC Monographs and Technical Advisory Committee for Global Adult Tobacco Survey, Ministry of Health and Family Welfare, Government of India.

DR. MIRA AGHI

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Dr Mira is a Behavioral Scientist with a PhD from Loyola University, Chicago and an honorary Professorship Universidad Del Salvador, Buenos Aires, Argentina. She is the recipient of all the three major awards in tobacco control: WHO Gold Medal, International Network of Women Against Tobacco and the Luther Terry Award.

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Dr Monika is the Director of the Health Promotion Division and Associate Professor at PHFI (Public Health Foundation of India). She has been involved in tobacco control research, policy advocacy, behaviour change intervention designing and evaluations. She is a member of various committees and task forces formed by Ministry of Health and Family Welfare, Government of India, to ensure effective implementation of tobacco control legislation. She had received WHO Director General 'No Tobacco Day Award' in 2012.

DR. NANDITA MURUKUTLA

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Dr. Nandita is the Director of Global Research and Country Director for India in the Policy, Advocacy and Communication (PAC) division of World Lung Foundation. She is a social scientist and an expert in the use of public policy and communication strategies to promote health, specifically in the areas of tobacco control, obesity prevention, road safety, maternal health and air quality.

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Dr. Kaur is currently working as the Chief Medical Officer in the Ministry of Health & Family Welfare, Government of India. She has extensive experience in implementing non-communicable diseases (NCDs) programmes, including NTCP in India. She has represented India in various international expert groups, and advisory committees including those involved in formulating guidelines under the WHO-FCTC.

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Dr Chand is currently working as the Additional Professor of Psychiatry, Centre for Addiction Medicine, Dept. of Psychiatry, NIMHANS. He has been part of the Tobacco Cessation Centre (TCC) NIMHANS, a resource center for South India and involved in developing an online training platform for health professionals on tobacco cessation and other addictions.

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Dr. Pratima is currently heading Centre for Addiction Medicine, Dept. of Psychiatry, NIMHANS. She is an international trainer in addiction management and has been involved in service, training and research in the area of addiction and mental health for over two decades. She is involved in training health care providers in tobacco cessation and has authored manuals on tobacco cessation for the WHO SEARO.

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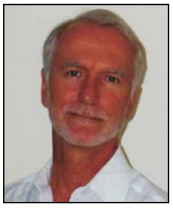

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CHAPTER 1

EPIDEMIOLOGY OF TOBACCO USE

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Describe the burden of tobacco use
2. List various stages of tobacco epidemic
3. Describe epidemiological determinants of tobacco use

KEYWORDS

Hardcore smoking, peer tobacco use, smoking, smokeless tobacco, second hand smoke, tobacco use

1. Introduction

Non communicable diseases (NCDs) are responsible for nearly 38 million deaths globally, of which three fourth are from Low and Middle Income Countries (LMIC) according to WHO estimates 2015. The mortality due to non-communicable diseases was projected to increase from 28.1 million in 1990 to nearly 50 million in 2020.(1) The Disability Adjusted Life Year (DALY) contribution of NCDs has increased from 43% in 1990 to 54% in 2010.(2) The growing burden of NCDs, which is closely associated with poverty, slows down the progress towards United Nation (UN) Millennium Development Goals (MDGs) and post 2015 agenda. The World Health Assembly in 2013 encouraged member states to accelerate national efforts for prevention and control of NCDs by setting up Global NCD Action Plan 2013–20 and a framework for comprehensive global NCD monitoring which included 25 indicators and 9 voluntary global targets (see Box 1) to be achieved by 2025.(3)

The voluntary global target 5 is related to tobacco use and set a 30% relative reduction in prevalence of current tobacco use among individuals aged 15 years or more by 2025.

2. History of Tobacco Use

2.1 World

Tobacco plants, native to America, were brought to Europe by early explores and exported to other countries through European colonization. In 18th and 19th century, the analgesic and antiseptic properties of tobacco popularized its production across different parts of the world. Tobacco was popularly smoked rolled up in a pipe or other during the rituals and ceremonies. The use of tobacco by the royal and affluent class of Europe escalated the cost of tobacco which in turn prompted English to grow it on their own. European colonization made tobacco

Box 1: Voluntary Global Targets for Prevention and Control of NCDs to be attained by 2025
Target 1: A 25% relative reduction in the overall mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory disease
Target 2: At least 10% relative reduction in the harmful use of alcohol, as appropriate, within the National context
Target 3: A 10% relative reduction in prevalence of insufficient physical activity
Target 4: A 30% relative reduction in mean population intake of salt/sodium
Target 5: A 30% relative reduction in prevalence of current tobacco use
Target 6: A 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstances
Target 7: Halt the rise in diabetes and obesity
Target 8: At least 50% of eligible people receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes
Target 9: An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major NCDs in both public and private facilities

a global affair. The cash returns and symbolism of affluent class made the tobacco cultivation and use wide spread even in poor countries. The sale and consumption of tobacco increased after World War II. The sale of tobacco products rose by 61% in mid twentieth century and cigarettes dominated over all other tobacco products.

The harmful effect of smoking was perpetrated by King James I (1604), who famously said *"a custom loathsome to eye, hateful to nose, harmful to brain, dangerous to lungs and in the black, stinking fume thereof nearest resembling the horrible Stygian smoke of the pit that is bottomless"*. The smoking was discouraged around the Europe with little impact except Germany in early twentieth century. Samuel Thomas von Soemmering from Germany reported occurrence of lip cancers among pipe smokers. Adler, Hoffman, McNally, Rofo and Meier, were few of the researchers who first thought about possible role of smoking in development of lung cancer based on their observation on increase number of lung cancers patients attending hospitals for treatment. However, the harmful effects of tobacco were not recognized till mid-twentieth century. Examining definitive cases of bronchogenic carcinoma, Wynder and Graham suspected etiological role of tobacco smoking in cancer development.[4] About 52% of "heavy smokers" compared to only 1.3% of "non-smokers" were reported to have bronchgenic carcinoma. In a landmark case-control study on smoking and lung cancers, Doll and Hill, in 1950 concluded a multifold increase in occurrence of lung cancers with the increase in cigarettes smoked per day.[5] The mortality from lung cancers was observed to increase steadily with the degree of smoking. The mortality rate was found to increase from 0.07 per 1000 for "non-smokers" to 0.47 per 1000 for "light smokers" to 0.85 per 1000 for "medium smokers" and highest being 1.66 per 1000 for "heavy smokers".[6] Doll and Hill also reported similar increasing trend of mortality from smoking for chronic bronchitis, peptic ulcer and tuberculosis in the same report.

Subsequently the association and causal role of smoking with lung cancer was studied. Harmond and Horn in 1958 reported an association between smoking habits and death rates based on the observation from a longitudinal study that the death rate among smokers increased by the degree of smoking. The causal role of smoking in lung cancer was concluded by US Surgeon General Report (1957) and Royal College of Physician London (1962).

2.2 India

Some strains of locally grown tobacco plants were present in India and were mainly consumed in chewing form like Betel Quid. The mushrooming of plantation of tobacco in India believed to occur when Portuguese merchants introduced the tobacco plants brought from Brazil during 1600 AD. The tobacco

quickly established itself as the most important commodity among the Portuguese colony who took up the new fashion of smoking and chewing tobacco. Hooka, a large waterpipe with a hose used to smoke tobacco, was introduced to Mughal Emperor Akbar and became popular where Mughals influence was strong. The commercial modernized cigarette was introduced in India by British East India company in late 18th century and the company started growing tobacco as a cash crop. The bidi industries began to grow in late 19th century. The huge impact of tobacco production on revenue compelled state patronage to tobacco trade in India even after independence. Today, India is the second largest consumer and third largest producer tobacco in the world. The consumption of smokeless tobacco has overtaken that of smoked forms in India (see Table 1).

3. Burden of Tobacco Use

Tobacco is a risk factor not only for non-communicable diseases but also for many communicable diseases like Tuberculosis (TB), allergic rhinitis, allergic dermatitis and food allergy. Maternal smoking during pregnancy is associated with high risk of adverse fetal outcomes like small for gestational age (SGA), low birth weight and preterm deliveries and increased risk of wheezing during childhood.

3.1. Global Burden

Today, tobacco worth US$ 20 billion is grown in 125 countries with five countries (China, India, Brazil, USA and Turkey) producing 2/3rd of world tobacco. Nearly 2/3rd of 6 million tobacco workers are from China, India and Indonesia. Tobacco remains one of the most important risk factors for global burden of diseases despite change in patterns of risk factors.[7] The tobacco smoking with second hand smoke contributed 6.1% (96% CI 5.4-6.8) of DALYs in 1990 and 6.3% (5.3-7) of DALYs in 2010 for global burden of diseases. Nearly 80% of one billion tobacco users live in low and middle income countries. According to WHO estimates 2014, tobacco kills nearly 6 million people every year which is projected to increase to 8 million by 2030. The total death attributed to tobacco use is projected to increase from 5.4 million in 2005 to 6.4 million in 2015 and will be responsible for 10% of all global mortality.[8]

The prevalence of tobacco use varies from country to country. The prevalence of smoking is most common in Europe and Western Pacific regions (Figure 1) where as smokeless tobacco use is more common in South East Asia region.

Global Adult Tobacco Survey 2008-2010 showed wide variation in prevalence of tobacco use (Highest in Bangladesh and lowest in Mexico).[10] The Global Youth Tobacco Survey (GYTS) collaborative group reported the median prevalence of ever tobacco smoking among age group of 13-15 years to be 33% (80% in Northern Mariana Islands, 3.4% in Tamil Nadu, India).The prevalence of current tobacco use among youth varies from 5.9% (Bangladesh) to 56.5% (Timor-Leste).[11] Water pipe smoking is a common form used commonly by youths, upper class and urban population mostly from middle east and some European countries.[12] Smokeless form of tobacco use is most common in South East Asian countries. Dual tobacco users varies from 5.6% (adult tobacco users) to 15.3% (all tobacco users) and prevalence of commonly used combinations are bidi-gutkha (1.76%), cigarette-Khaini (1.28%) and cigarette-Gutkha (1.22%). There is an increasing trend of smokeless tobacco use among young adults and youth. The use of smokeless tobacco has increased in Bhutan (9.4% in 2009 to 23.2% in 2013) and Nepal (6.1% in 2007 to 16.1% in 2011).[13] The increasing trend of smokeless tobacco use is more evident in use of snuff (a significant increase of 2.8% +/- 0.2%, 2010) among US young adults.

3.2. South East Asia Region

Both smoke and smokeless form of tobacco use are very much prevalent in South East Asia (SEA) region. Though smoking is decreasing as a result of efforts from governments [14,15], the use of smokeless tobacco products is on upswing in many SEA countries. South East Asia region houses one quarter of world population and the same proportion of smokers. Smoking is more common among males and smokeless form of tobacco use among females. Smoking among adult men varies from 24.3% (India) to 63.1% (Indonesia) and among females from less than 1% (Sri Lanka) to 15% (Myanmar & Nepal).[16] The smokeless tobacco constitutes a high proportion of overall tobacco use in India and Bangladesh (Figure 2). The smokeless form of tobacco use which began to increase in early 1970s became well established in the SEA region from 1985 onwards. The prevalence of smokeless tobacco use varies from 1.1% (Thailand) to 31% (Myanmar) among males and from 4.6% (Nepal) to 27.9% (Bangladesh) among females. SEA region has nearly 400 million tobacco users, with maximum residing in Indonesia.

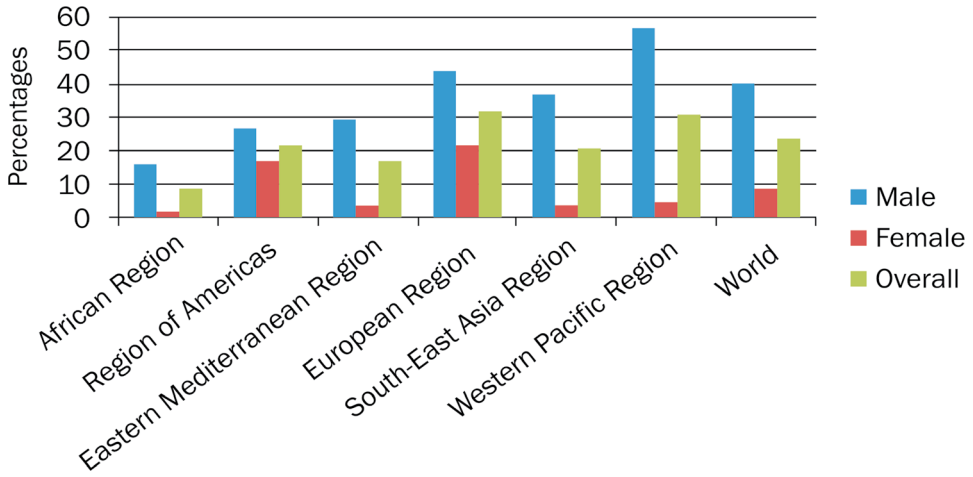

Figure 1: Prevalence of tobacco smoking (%) among adults, by WHO region and Gender (Data source: Gender, women and tobacco epidemic WHO 2009)[9]

Hardcore smoking is mainly seen in SEA region. Hardcore smoking is a form of current daily smoking in which the smokers satisfies the following criteria (1) current daily smoker (2) no quit attempt in the past 12 months of survey or last quit attempt of less than 24 hours duration (3) no intention to quit in next 12 months or not interested in quitting (4) time to first smoke within 30 minutes of waking up, and (5) has knowledge of smoking hazards. The 31.3 million hardcore smokers who constitutes about 18-29% of daily smokers resides mainly in India, Thailand and Bangladesh. The prevalence of Hardcore smoking varies from 3.1% (India) to 6% (Thailand).

About one fifth of the tobacco attributable deaths occurred in SEA region. More than half (55%) of the deaths are due to NCDs in SEA region and it varies from 34.4% (Timor Leste) to 79.4% (Maldives). Nearly one third of the deaths due to NCDs occur before 60 years of age. According to 2008 estimates about 1.1 million people in this region died of cancers most of which were related to smoking. People from poor socioeconomic status spend significant proportion of their income on tobacco products in some of the SEA countries. Nearly 15 million people are estimated to be trapped into poverty every year because of tobacco use.

Second hand smoke (SHS) related morbidity is high in SEA region compared to rest of the world with adults having risk of asthma and ischemic heart diseases where as children are at the risk of respiratory infections.[17] In SEA region SHS exposure varies from 29% (India) to 53.5% (Thailand) among adults (GATS 2009-10) both at homes and public places. However, SHS exposure is high at public places than homes among youths with highest prevalence in Indonesia & Timor Leste (>60%).

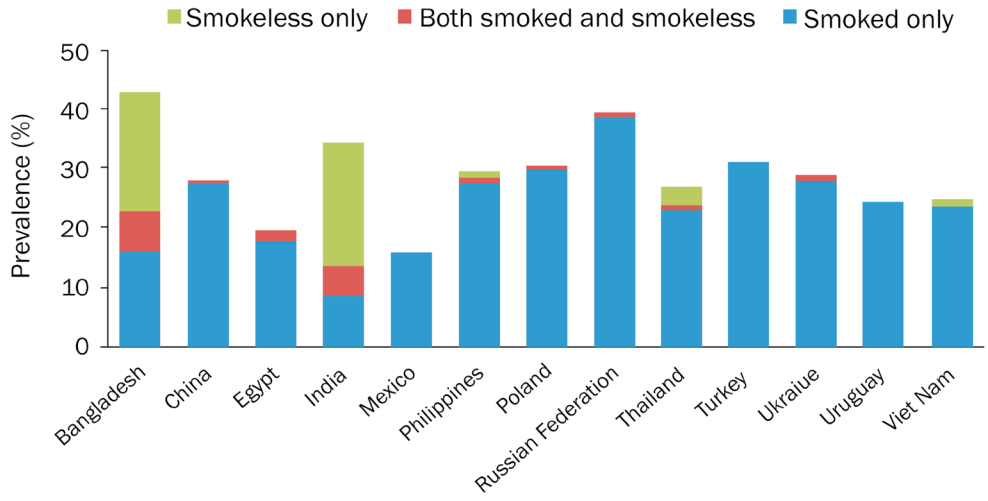

Figure 2: Type of tobacco use among individuals aged 15 years and above in 13 LMIC, GATS, 2008-10

(Source Palipudi et al)[10]

3.3. India

Various surveys including National Family Health Survey (NFHS), Global Adult Tobacco Survey (GATS-India) and Global Youth Tobacco Survey (GYTS-India) provide national level data on tobacco use.

According to GATS 2009-10, the prevalence of current tobacco use in any form in India is 34.5%; among males 48% and among females 20%. The prevalence of current smokeless use is high for both males and females than that of smoking (figure 3). Females are almost six times more likely to use smokeless tobacco than smoking in India. Within India, among males highest prevalence of smoking is present in Madhya Pradesh (59%) and Meghalaya (52%) where as smokeless tobacco use is most prevalent in Jharkhand (45.8%) and Bihar (45.9%). Among females highest prevalence of both smoking (12.6%) and smokeless tobacco use (42.5%) is present in Mizoram.

Nearly 10% of the minors (15-17 years) consumes tobacco in India. Half of the Indian adults are exposed to SHS at homes which is more in case of females than males. The SHS exposure at public place is 29%.

3.4. Global Trends of Tobacco use

By 2030, another 1 billion smokers will add to present 1 billion smokers (in 2012) worldwide. The death toll of 0.1 billion attributed to tobacco in 20th century is projected to increase by 10 times in 21st century. According to WHO estimates, consumption of tobacco and second hand smoke will kill 6 million and 0.6 million individuals every year respectively. China the largest producer and consumer of tobacco products globally has witnessed increase in per capita daily consumption of one cigarette (1952) to 10 cigarettes (1990). In China, by 2050, persistence of this pattern can lead to 3 million deaths attributed to tobacco and over 100 million tobacco related deaths among men who were under 30 years of age in 2003. An analysis of WHO Comprehensive Information System for Tobacco control showed decreased prevalence of tobacco use among males in 125 countries and females in 156 countries between 2000 and 2010, and if the trend continues only 37 and 88 countries will be on track to achieve global voluntary target for reducing current tobacco use by 2025 for males and females respectively. Though the prevalence of daily smoking has decreased for both males and females, the number of daily smokers has increased from 721 million in 1980 to 967 million in 2012 globally.[18] The prevalence of smoking is falling among males in almost all countries though slowly however data on female smokers shows wide variation among countries. Few developed countries like US, UK, Canada and Australia have shown declining smoking trend among female where as developed countries from central or eastern europe and developing countries have witnessed no change or increasing trend. The number of cigarettes smoked world wide has increased from 10 billion (1880) to 5500 billion (2000) with China (1st), USA, Japan, Russia and Indonesia making into the top 5 countries. Quitting rate for tobacco use is less than 20% in China, India, Russia, Egypt and Bangladesh.[19] Educated males are giving up tobacco use but the tobacco use is becoming more popular among uneducated poor individuals especially from LMICs.

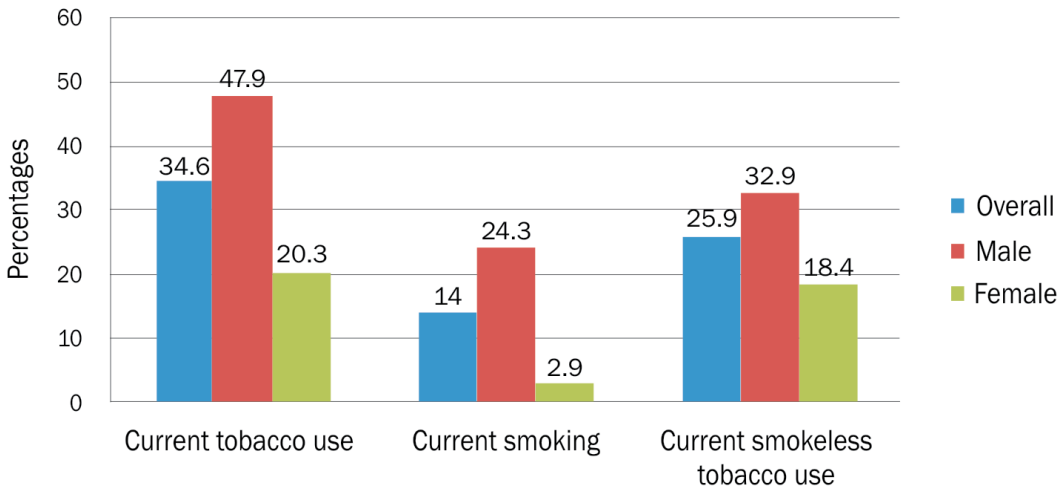

Figure 3: Prevalence of different forms of current tobacco use in India

(Data Source: GATS 2009)

Table 1: National level data on prevalence of current tobacco use (%) in India

Tobacco form	Gender	NFHS 2 (1998-99)	NFHS 3 (2005-06)	GATS (2009-10)
Over all	Male	46.5	57.6	49.9
	Female	13.8	10.8	20.3
Smoked form	Male	29	33	24.3
	Female	3	2	2.9
Smokeless form	Male	28	37	33
	Female	10	8	18.4

NFHS: National Family Health Survey, GATS: Global Adult Tobacco Survey

3.5. Trends in SEA Region

The high prevalence of tobacco use among children and adolescent indicates an increasing tobacco use in future. Though the consumption of smoked tobacco has decreased in many countries of SEA region, the prevalence of smokeless tobacco use has increased especially among females, rural population and youths. Increase in tobacco price and ban on tobacco promotion and sponsorship (TAPS) have resulted in availability of smuggled manufactured cigarettes at cheaper price and switching over to other forms of cheap tobacco products.

National level survey data from India showed decrease in smoking and increase in smokeless form of tobacco use for both genders. (Table 1) There is a lowering in age of initiation of tobacco use especially among females as a result of TAPS activities by tobacco industries, peer pressure and smoking parents. Despite having legislation against tobacco use and measures undertaken by government, the prevalence of tobacco use has not declined as expected in India.

4. Stages of Tobacco Use

The tobacco epidemic is characterized and stages are defined based on prevalence of tobacco use, consumption of tobacco use and mortality due to tobacco use. For all practical purposes smoking is used as a proxy for "tobacco use", as reliable large scale data on smokeless tobacco is not available. Four stages of cigarette epidemic (see Box 2) is proposed by Lopez AD.[20] Different countries are in different stage of cigarette epidemic (see figure 4), which may change based on the three parameters mentioned above.

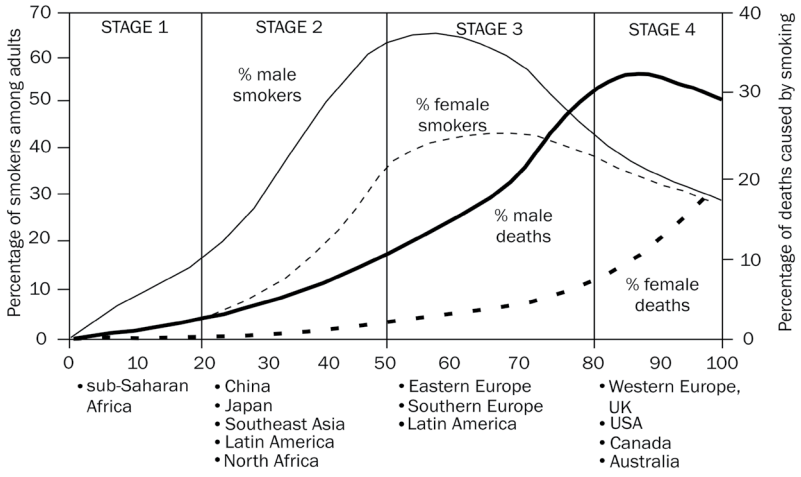

Figure 4: Four stages of tobacco epidemic (Source: The Tobacco Control Country Profiles, 2nd Edition 2003)

Source: Lopez AD, Collishaw NE, and Piha T. (1994). A descriptive model of the cigarette epidemic in developed countries. Tobacco Control 3: 242-247 Reproduced by permission of BMJ Publishing Group.

Box 2: Stages of Cigarette (Tobacco) Epidemic	
Stage I	◆ Male smoking < 15%, Female smoking < 5% ◆ Tobacco consumption < 500/year/adult mostly by males ◆ Deaths attributed to smoking is not evident or very few compared to non-smoking population ◆ No tobacco control activities ◆ Initial phase (may span for one or two decades)
Stage II	◆ Male smoking 50% - 80%, Female smoking rises rapidly but lags behind male smoking by one or two decades ◆ Cigarette consumption 1000 -3000/year/adult and mostly by males ◆ Tobacco related deaths among males 10% of all deaths, among females very few ◆ Tobacco control activities are unsystematic ◆ Span for 3-4 decades
Stage III	◆ Decline in male smoking prevalence to around 40% after it has exceeded 60%. Many ex-smokers among middle and old age males ◆ Smoking prevalence plateau for a long period after reaching peak of 35-45% and there after declines slightly ◆ Cigarette consumption (Male: 3000-4000/year/adult, Female: 1000-2000/year/adult) ◆ Smoking attributable deaths among males increases from 10% to around 30% of all deaths and among females upto <5% ◆ Systematic tobacco control programme exits
Stage IV	◆ Smoking prevalence declines for both sexes. Male prevalence around 30% and female prevalence 33-35% ◆ Smoking attributable deaths among males declines below 30% after reaching the peak of 30-35% and among females rises to a peak of 20-25% ◆ Demand from people for smoke-free environment and legislation

5. Epidemiological determinants of tobacco use

5.1. Types of tobacco products

Apart from nicotine, tobacco contains more than 50 carcinogens which have been classified into Polycyclic Aromatic Hydrocarbons Aromatic amines and N-nitrosamines. Tobacco products are available in following forms: smoked (cigarettes, bidis), smokeless (betel quid, khaini, zarda moist snuf) and E-cigarettes. The details of tobacco products are described in the subsequent chapters.

5.2. Tobacco and Gender

The tobacco use continues to be higher among males than females. Age-standadized prevalence of daily tobacco smoking among individuals aged 15 years and above declined from 41.2% in 1980 to 31.1% in 2012 for males, and from 10.6% in 1980 to 6.2% in 2012 for females. The most remarkable difference in smoking prevalence among males compared to females is evident in Western Pacific (11 times) and South East Asia Regions (9 times) compared to Americas (1.6 times) and Europe (2 times). Smoking prevalence among males is higher in middle income countries (45%) than high income countries (32%), but for females it is higher in high income countries (18%) than middle income countries (7%). In SEA region, smokeless forms of tobacco use is higher among males than females in Bhutan, India, Nepal, Sri Lanka and Myanmar, but reverse is true for Thailand, Bangladesh and Indonesia. The prevalence of smokeless tobacco use among males varies from 51% in Myanmar to 1.1% in Thailand while among females it varies from 27.3% in Bangladesh to 1.9% in Timor-Leste.[21, 22] The gap in prevalence of tobacco use between males and females is less for smokeless form (26.3% Vs 17.3%) than smoked form (15% Vs 1.9%) and the rural females (23.3%) consumes more tobacco than urban females (11.8%).[21] The consumption of cigarettes is less compared to other forms of tobacco among boys and girls (Table 2). The prevalence of tobacco use was significantly

Table 2: Prevalence of tobacco use among youths by gender and WHO region

WHO region	% currently smoked cigarettes			% currently used tobacco products other than cigarettes		
	Boys	Girls	Difference	Boys	Girls	Difference
African Region	13.5	5.2	-8.3*	11.9	10.6	-1.3
Region of the Americas	13.5	15	1.5	12.3	6.8	-5.5*
Eastern Mediterranean Region	7.3	2	-5.3*	14.3	9.1	-5.2*
European Region	21	17.4	-3.6	12.1	7.5	-4.6*
South East Asia Region	9.5	2	-7.5*	12.5	7.1	-5.4*
Western Pacific Region	18.5	8.4	-10.1*	7.2	6.1	-1.1
Over all	12.1	6.8	-5.3*	12.2	7.5	-4.7*

**statistically significant difference (p<0.05)*

higher among boys than girls in South East Asia region; highest prevalence (Bhutan, Boys - 27.2% Girls - 19.8%) and lowest prevalence (Bangladesh, Boys-7.1%, Girls - 3.2%).The prevalence of smoking among males has come down and the prevalence of smokeless tobacco use has increased in India.[21] The prevalence of smoking among Indian women has almost doubled from 1.4% (2005) to 2.9% (2011).[23]

5.3. Tobacco and Age

According to WHO estimates, nearly half of the projected deaths of 450 million between 2000 and 2050 is expected to occur among individuals aged 30 – 69 years. According to GATS 2009-10, higher prevalence of tobacco use occurs in the middle age (25-44 years) and the odds are for the same increases in all countries with older age compared to younger age (15-24 years) however reverse is true for Russia, Uruguay and Ukraine. The smoking prevalence increases with age for both males and females, however the prevalence slightly decreases for males aged 65 years and above (56%) compared to males aged 45 -64 years (61%). Most smokers initiate smoking before reaching adulthood. Globally about 23 % of the students who had ever smoked, smoked their first cigarette before 10 years of age [Manipur, India (88%), Buens Aires, Argentina (6%)]. The youth smoking is influenced by tobacco industry advertizing, easy access and low prices, smokers in the family and peer pressure.

5.4. Tobacco and Education

Tobacco use is more common among illiterate or less educated individuals probably because of lack of awareness. GATS 2009-10 and various studies from different countries showed inverse relationship between tobacco use and education level. There is a decrease in prevalence of tobacco use among individuals with no formal education to those with secondary or more education (India 44% to 21%, Africa 21% to 6%).

5.5. Tobacco and Region / Residence

The prevalence of smoking varies among WHO regions; Western Pacific Region (highest, 57%), African Region (lowest, 15%). Chewing tobacco is most common in some Asian countries (India, Nepal, Bangladesh, Myanmar). Hardcore smoking is most prevalent in India, Thailand and Bangladesh. Reverse smoking is prevalent (44%) in Srikakulam District of India with a female to male ratio of 1.7:1.[24]

The prevalence of smoking as well as smokeless tobacco or both is more common in rural areas compared to urban areas. Smokeless tobacco use is more common among rural children and adolescents than tobacco smoking. The mean age of first cigarette smoking is one year later in rural than urban area where as reverse is true for smokeless tobacco use among children and adolescents. Among countries who participated in GATS survey, the prevalence of tobacco smoking was significantly higher among rural than urban population in India and Thailand.[10]

5.6. Tobacco and Socio-economic status (SES)

Tobacco use is more prevalent among poor. With increase in SES or wealth index the odds of tobacco use decreases most probably due to better access to health information. Both smoking and smokeless tobacco use were more prevalent among poorest men (Smoking-21.96%, Smokeless – 7.76%) than the richest men (Smoking – 13.4%, Smokeless – 1. 79%) in Africa. NFHS India– 2nd & 3rd round also reported inverse relation between tobacco use and SES.[25] The risk of tobacco consumption (Smoking-1.6times, Smokeless – 3.1times) is higher for poorest compared to richest.[26] However, the proportion increase in smoking is higher among richest (50%) than poorest (35%). Students from low SES are more vulnerable and have higher adjusted prevalence of ever tobacco use than those from higher SES.

5.7. Tobacco and Socio-environmental factors

Various socio environmental factors like parental tobacco use, peer tobacco use, cost of tobacco products and advertisement influence tobacco use among adolescents.

Parental influence on tobacco varies across countries. Smoking parents in the house may give perceived indirect approval and easier access to smoking among adolescents. Studies have reported a strong correlation between parental and offspring smoking. In Europe, parental smoking was reported to positively influence regular smoking before 18 years of age (OR 1.6, 95% CI 1.21-2.12).The association between parental smoking and offspring smoking may be gender specific as a strong association was observed among female students (but not for male students) and their parents.[27] Maternal smoking during or after pregnancy strongly influences adolescent smoking.

Peer affiliation influences young adolescents for willingness to confirm peers, being in the crowd, getting emotional and instrumental support and most importantly social interaction. Sometimes peer affiliation or friendship develops as a result of availability of smoking. Peer tobacco use has a great influence on initiation and maintenance of adolescent tobacco use.[28-30] Nearly 50% of the students get their 1st cigarette from friends and smoke out of respect for the friend. Having a close friend or a sibling who smokes is an important predictor of adolescent smoking. Among Iraqi adolescents those with close friends who smoke or use smokeless tobacco are more likely to smoke (2.67 times) or use smokeless tobacco (8.18 times) than other adolescents with out friends who smoke or use smokeless tobacco products. Nearly two-third of ever smokers initiate smoking because of close friends who smoke. Females, having peers who smoke, generally initiate smoking at an early age.

Price of tobacco products greatly influences consumption. High price of tobacco products prevents initiation of smoking among adolescents especially from LMICs, ex-smoker from restarting and persuades smokers to quit.[31] Not only price of tobacco products but also income level determines the tobacco consumption. Despite increased price of tobacco products, the high income level makes it affordable in most developed countries and few developing countries. The low price/cost of cigarette makes bulk purchase affordable. With availability of cigarettes in wide price range, people switch from costly manufactured brand to cheaper local brand when ever tobacco price is increased, as evident from Germany between 1991-2006.[32]

Tobacco advertisement promotion and sponsorship (TAPS) activities greatly influence initiation, reinforcement and maintenance of tobacco use. Worldwide, 12.5% of never-smoking youth are susceptible to smoking due to promotional activities by tobacco industries apart from influence from media, family and peers. Advertisement/promotion in any form is associated with initial susceptibility to smoking among both genders. A causal relationship exists between tobacco promotion and initiation of smoking among adolescents as explained by exposure before initiation of smoking and a dose-response relationship between tobacco promotion and risk of initiating smoking.[33] Impulse purchasing and craving for smoking can result following seeing a tobacco product displayed. Almost all smokers have been exposed to at least one advertisement in their lifetime. Point of sale promotion, ease of getting tobacco products and peer prevalence influence initiation of tobacco use among children and adolescents. The on-screen smoking by favored movie stars positively influences smoking behaviour of adolescents and receptivity to smoking increases on viewing favorite star smoking more frequently or more movies which have on-screen smoking scene as evident among youths from Mexico and Germany. Adolescents exposed to tobacco promotion are more likely to experiment with smoking. Adolescents who

experiment with smoking or think they can quit anytime are more likely to progress to established smokers. About 32% and 52% of adolescents from California in 1993 who had experimented with smoking and those who showed willingness to use a promotional tobacco product believing that they can quit anytime respectively became established smoker in 1996.[34]

Personal level factors such as stress, depression and other psychiatric disorders, body weight/image and physical dependence influence the use of tobacco products. Women are more likely to have anxiety disorders and use smoking as a coping means. This promotes initiation of tobacco use and frequent relapse after successful cessation or quitting. Smokers have a higher probability of psychiatric disorders than non-smokers. Conversely, individuals with psychiatric disorders are more likely to be smokers than general population.

5.8 Second Hand Smoke (SHS) [Environmental Tobacco Smoke (ETS)]

Second hand smoke is a mixture of exhaled mainstream smoke and side stream smoke released from a smouldering cigarette or other smoking device (cigar, pipe, bidi etc.) and diluted in the ambient air (World Health Organization). Second hand smoke which contains carcinogenic particles similar to other tobacco products poses adverse health effects especially for children and non-smokers. There is no safe limit for exposure to second hand smoke. According to GATS-India 2009-10, nearly half the adults are exposed to second hand smoke at home and about 29% at public places, especially and in restaurants and public transport. Though adult males and females are equally exposed to SHS, proportion of males (32.2%) exposed to SHS is more than females (19.4%) in workplace. The proportion of rural adults exposed to SHS is more both at home (58% Vs 32.5%) and workplace (32% Vs 27.6%) than that of urban adults.

Summary

Tobacco originally from native Americas is grown worldwide at present and the modern tobacco is believed to be introduced to India by Portugese. Tobacco is the leading cause of preventable premature mortality worldwide. The tobacco attributed deaths are projected to increase from 6 million a year to 8 million a year by 2030 and in the same time period 1 billion new smokers will add to present 1 billion smokers (in 2012) worldwide. India registered decrease in prevalence of smoking and increase in prevalence of smokeless tobacco use and strikingly lowering of age of initiation of tobacco use especially among females. Currently India is in second stage of tobacco epidemic. Chewable tobacco, a form of smokeless tobacco, is mainly prevalent in South East Asian countries including India. The Doll & Hill study formed a landmark on role of tobacco in diseases especially lung cancer. Tobacco is the most prevalent behavioural risk factor for NCDs and commonly associated with some respiratory infections especially tuberculosis. The tobacco use is more prevalent among males, middle and old age people, uneducated or less educated people and people from poor socioeconomic status. Youth tobacco use is increasing especially in LMICs and is influenced by parental tobacco use, peer pressure, easy availability and accessibility, and TAPS activities by tobacco industries. Personal level factors such as stress, depression and other psychiatric disorders, body weight/image and physical dependence influence the use of tobacco products and are responsible for frequent relapse among the tobacco users.

Unit Review Questions

1. Describe in details the stages of tobacco epidemic.
2. Explain the determinants of tobacco use in LMICs.
3. Dual smoking
4. Hard core smoking

Application question (s)/ Assignment

1. Why do the youth starts smoking?
2. How does the people from low SES get trapped into tobacco use?

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CHAPTER 2

TOBACCO USE PRACTICES IN INDIA

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

- Discuss the History of tobacco use in India
- Discuss different forms of tobacco smoking in country
- Discuss different forms of chewable tobacco used in the country
- To understand the different types of tobacco use according to geographical area, socioeconomic status, gender and cultural belief

KEYWORDS

Arecanut, nicotine, smoking, smokeless tobacco, tobacco,

1. Introduction

Tobacco is mainly derived from the leaves of plant *Nicotiana tabacum*. It was introduced to India by Portuguese in 1600AD and became an integral part of Indian culture due to wide spread social acceptability. Gradually it became an important commodity in barter trade and India started growing tobacco as a cash crop. The overwhelming growth of tobacco market in India is not only driven by the economy but also by multitude of cultural, social factors. It is used in different parts of the country as a form of etiquette to offer paan, cigarette, bidi and other forms of tobacco to the guests and visitors. The main enigmatic alkaloid of tobacco called "Nicotine" has addictive properties by various mechanisms which is beyond the purview of this chapter.

2. Different Forms of Tobacco

Tobacco is used mainly in two forms e.g Smoking. Smoking and smokeless (Chewing). In India, 35% of adults are current tobacco users. Global Adult Tobacco Survey (GATS) 2010 reported about 8.7% adults used smoking form, where as 20.6% used smoke less form of tobacco alone. 5.3% of adult tobacco users used both forms of tobacco.

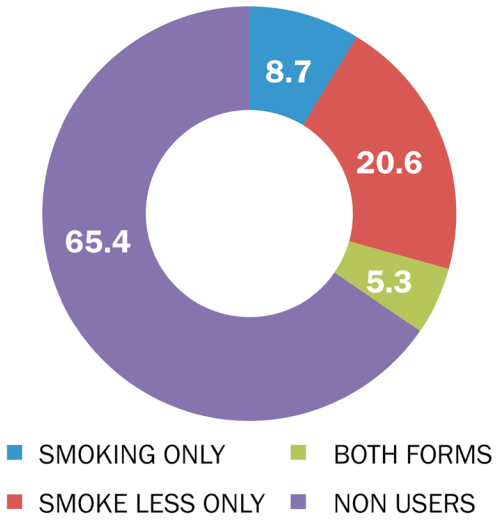

Figure 1: Distribution of Adult Tobacco users According to Type of use

Source: GATS, 2009-10 Fact sheet India

2.1 Smoking

Since its introduction in the 16th century numerous ways of smoking tobacco have been innovated in India.

1. Beedi	7. Reverse Dhumti
2. Cigarettes	8. Pipe
3. Cigars	9. Hookah
4. Chuttas	10. Chillum
5. Reverse Chutta	11. Hooklis
6. Dhumti	12. Pipe

2.1.1. Bidi

Bidi is the most popular smoking form of tobacco in India, mainly in the rural areas. These are prepared by rolling dried piece of tendu leaf with small amount (0.15-0.25gm) of sundried, flaked tobacco. About 34% of the tobacco produced in India is used for making bidi.[1] The dimension of bidi available in Indian market varies from 5-6 cm. There are more than 300 brands of bidi available in Indian market[2] bidis are smaller in size and inexpensive compared to the cigarettes, so more bidis are smoked and has a market share of about 85% in India.[3] About 69% of smokers use bidi as a form of smoking in India of which 81% are in rural and 51% are in urban area[4] GATS India reveals that about 9.2% adults are current bidi smokers, out of which 16% were males and 1.9% were females (Figure 2). According to a recent study, bidi consumption is highest in Haryana (41%) and lowest in Jharkhand (3.2%)[6]. Bidi smokers are at a higher risk of developing oral cancer, lung cancer and vascular diseases as compared to non smokers.[7] In addition to the users, the workers involved in bidi manufacturing also are at a greater risk of developing tobacco associated health problems, e.g., respiratory dermatological, ophthalmic and podiatric diseases, due to inhalation of tobacco and postural problems involved in preparation of bidi.[8]

2.1.2 Cigarettes

Cigarette is a cylindrical roll of fine cut cured tobacco wrapped in a thin paper used for smoking. Cigarette is the second most popular smoking form of tobacco used in India after bidis. There are about 26% cigarette users in India of which 12% are in rural area and 47% are in urban area.[9] As per data from the GATS 2010 India, current cigarette smoking prevalence among adults is 5.7%, of which 10.3% were males and 0.8% were females (Figure 2).Prevalence of cigarette use is highest in Jammu & Kashmir as per a recent study[10] Cigarette length available in Indian market varies from regular 69mm to long 102mm. It comes with or without filters, though without filter are gradually becoming obsolete from the market. Variations in the types of cigarettes as thin, low-tar, menthol, flavoured have been adapted as a marketing strategy to entice more users, including youth and women and lure the users that these cigarettes have a lower health risk.

2.1.3 Cigars

A cigar is a roll of tobacco wrapped in leaf made of air-cured, fermented tobacco, usually in factories. Cigar smoking is predominantly an urban practice and less prevalent in India due to expensive nature

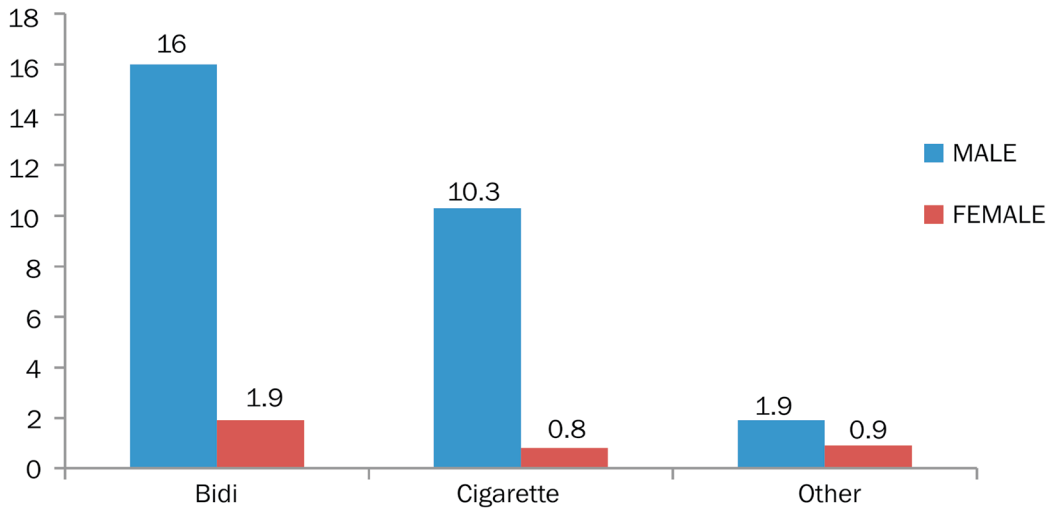

Figure 2: Genderwise Distribution of Smoking Tobacco Products Among The Adult Population

Source: GATS, 2009-10 Fact sheet India

of the product. Therefore it is mostly limited to the upper socio-economic strata in India. Many people view cigar smoking as less dangerous than cigarette smoking but one large cigar can contain as much tobacco as an entire pack of cigarettes.

2.1.4 Chutta & Reverse Chutta

Chutta is a coarsely prepared cheroot produced by small-scale industries or made at home. Nearly 9% of the tobacco produced in India is used for making chuttas. It is estimated that about 3000 million pieces of chutta are made annually in India. Chutta smoking is widespread in the coastal areas of Andhra Pradesh, Tamil Nadu and Odisha. The term reverse smoking is used to describe smoking while keeping the burning end of the tobacco product inside the mouth. Reverse chutta smoking is practised extensively by women in the rural areas of Visakhapatnam and the Srikakulam district of Andhra Pradesh. In the Srikakulam district, 46% of the 10,169 individuals surveyed smoked reverse and this practice was more common among women (62%) than men (38%).[10] Fishermen also do reverse smoking in order to avoid extinguishing the lighted end of the chutta.

2.1.5 Dhumti & Reverse Dhumti

Dhumtis are self prepared conical cigar made by rolling tobacco in the leaf of another plant. In a random sample of about 5400 villagers in Goa, 4% were dhumti smokers. The burning end may occasionally be inside the mouth during smoking which is called reverse dhumti. The overall prevalence of this form of smoking is 0.5% in Goa.[11]

2.1.6 Pipe

Pipe smoking is one of the oldest forms of tobacco use. The different kinds of pipes used for smoking range from the small-stemmed European type made of wood to long-stemmed pipes made from metal or other material.

2.1.7 Hookli

Hooklis are clay pipes commonly used in western India. Once the pipe is lit, it is smoked intermittently. Hookli smoking was practised by 11% of the 5227 men studied in the Bhavnagar district of Gujarat.[12]

2.1.8 Chillum

Chillum smoking is an exclusively male practice. It is limited to the northern states of India, predominantly in rural areas. The chillum is a straight, conical pipe made of clay, 10-14 cm long, held vertically. In a survey of 35,000 individuals in the Mainpuri district of Uttar Pradesh, 28% of the villagers were found to be chillum smokers. Chillum smoking requires a deep pulmonary effort. Often, one chillum is shared by a group. Therefore, in addition to cancer, chillum users are at a risk of contracting other infectious diseases like flu and other infectious lung diseases. They are made locally, are inexpensive and easily available. Chillum probably predates the introduction of tobacco to India and was used for smoking opium and other narcotics.[13]

2.1.9 Hookah

The hookah is an Indian water pipe in which the tobacco smoke passes through water before inhalation. In a random sample of 4859 men and 5481 women from the Darbhanga district of Bihar,2% and 28%, respectively, reported smoking the hookah.[14] The reason given for this female predominance is that it is inconvenient for men to carry a hookah, whereas women remain at home most of the time. Hookah smoking appears to be on the decline in India. In northern part of India, hookah is a common practice among the elderly people of villages. Hookah sharing in gatherings, Panchayat meetings by the representatives from different houses, villages is a mark of peace and harmony among the local group. Of late it is being promoted as a sign of royalty and prestige, especially targeting the younger urban adults, and is available in high priced coffee shops in flavours like apple, strawberry, and chocolate. It is marketed as a safe recreational activity, but it is not safe and is finding increasingly use among college students of both genders. Use of tobacco in this form can result in tobacco addiction.

2.1.10 Meiziol

Meiziol is local practice of smoking in Mizoram made from vaihlo (*Nicotiana dadacum*) tobacco. The tobacco leaves are thrashed by feet until the leaves become soft and then sun dried or sometimes in a warm place like over the fireplace without applying direct heat. The dried leaves are cut into small flakes and rolled using a thin paper up to a length of 6-7cm. The tobacco content of meiziol varies from about 0.8 to 1 g. A study has reported increased risk of stomach cancer associated with smoking meizol.[15]

2.2 Smokeless forms of tobacco

The term smokeless tobacco is used to describe tobacco that is consumed without heating or burning at the time of use. Smokeless tobacco can be used orally or nasally. The oral use of smokeless tobacco is widely prevalent in India. Different methods of consumption include chewing, sucking and applying tobacco preparations to the teeth and gums. Smokeless tobacco products are often made at home but are also manufactured commercially. Recently, various varieties of smokeless tobacco products have been produced industrially on a large scale, commercially marketed and are available in small plastic and aluminium foil packets. GATS 2010 reports smokeless form of tobacco use to be about 20.7% among the adult tobacco users.

2.2.1 Paan (betel quid) with/without tobacco

Paan chewing (betel quid) is an age old practice in many parts of India among all the social classes throughout the year and its use increases during the festive seasons because of its association with culture and customs in different regions across the country. Paan consists of four main ingredients, e.g., Betel leaf (Piper betel), areca nut (*Areca catechu*),slaked lime [$Ca(OH)_2$] and catechu (*Acacia catechu*). Betel leaves contain volatile oils suchas eugenol, terpenes and other phytochemicals like chavibetol, chavicol, hydroxychavicol.[16] Cardamom, clove and other flavouring and sweetening agents may be added in preparing quid as per preferences. Betel leaf alone is found to have many medicinal properties like astringent, antiseptic and antioxidant properties.[17] Areca nut contains alkaloid coline, which is a vasoconstrictor and has psychoactive properties. Areca nut chewing induces submucus fibrosis in oral mucosa. Slaked lime is alkaline in nature and is basically used in paan in thin coatings to neutralize the strong astringent property of paan. Traditionally it is believed to help in digestion along with paan. It has been reported that lime releases reactive oxygen from the components of areca nut which can contribute to cytogenetic damage leading to oral cancer.[18] Gradually, tobacco became an important constituent of paan, and currently most habitual paan chewers include tobacco along with the above mentioned components which increases risk of oral cancer. About 7.5% males and 4.9% female use betel quid with tobacco as a form of smokeless tobacco as per GATS 2010, India (Figure 3).

2.2.2 Paan masala/Guthka

It is a commercial preparation containing a blended mixture of areca nut, slaked lime, catechu and condiments, with or without powdered tobacco. Paan masala is a dehydrated variant in attractive packs of tin or sachets, to have a greater shelf life and portability. Paan masala is mainly used in urban areas but gradually gaining popularity in rural areas also. Paan Masala are marketed more glamorously and portrayed as harmless mouth fresheners which is actually not true. Areca nut itself has addictive properties and induces submucosal fibrosis of oral cavity. Catechu causes staining of teeth and soft tissue of mouth. Many times paan masala contains nicotine which is not disclosed on the label of the product and no warning sign of health hazards is there on the product. Therefore, many younger individuals, women and children are getting addicted to the paan masala with an assumption it being harmless. According to GATS 2010 report, about 13.1% males and 2.9% females use Guthka in the country (Figure-3).

2.2.3 Mainpuri tobacco

In the Mainpuri district of Uttar Pradesh and nearby areas, this preparation is very popular. It contains mainly tobacco with slaked lime, finely cut areca nut, camphor and cloves. In a study of 35,000 individuals in Mainpuri, 7% of the villagers used this product.[19]

2.2.4 Tobacco and slaked lime (khaini)

It is a mixture of dried tobacco and slaked lime and is used in several parts of the country, predominantly in north India. The usual method of carrying the khaini is a small flat double compartmental metal or plastic container with opening at both ends containing tobacco flakes in one side and moistened slaked lime at the other. Tobacco flakes in desired quantity and lime is dispensed on the palm and then thoroughly mixed by using thumb before putting in the mouth preferably in the buccal or lingual vestibule and sometimes on the dorsum of the tongue. Placing khaini in different areas of oral cavity varies across the country as per the regional practices. The practice was found to have higher male prevalence than females.[20] There are 18% males and 4.7% female khaini users present in India as per GATS, 2010 (Figure 3).

2.2.5 Snus

It is a teabag like pouch of Swedish snuff which can be kept in the buccal or labial vestibule like the khaini

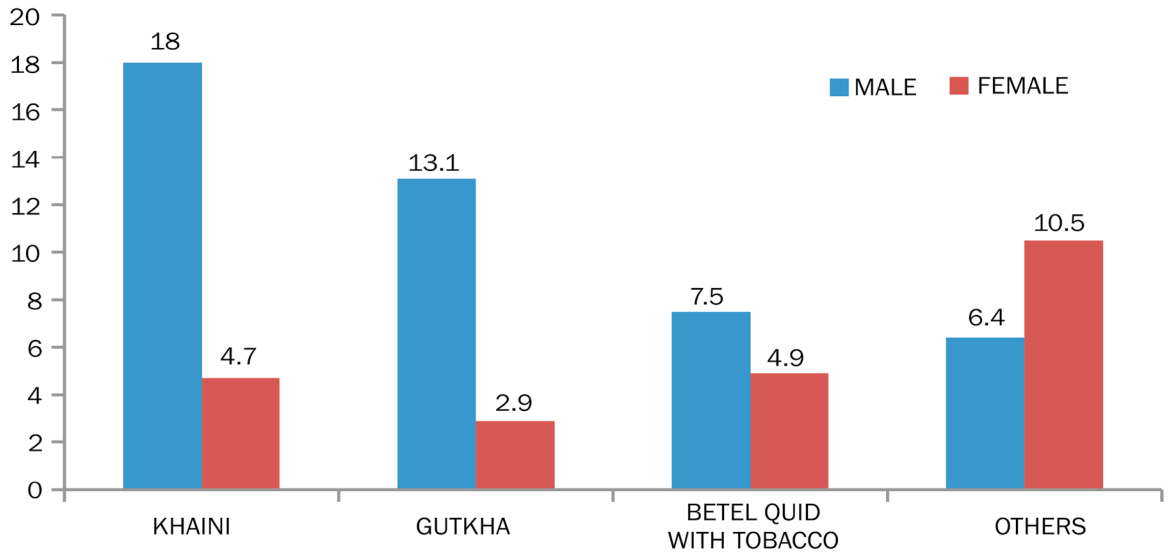

Figure 3: Genderwise Distribution of Smoking Tobacco Products Among The Adult Population

Source: GATS, 2009-10 Fact sheet India

or a quid and sucked for a prolonged period of time. It is available commercially under brand name Click marketed by the Swedish company.[21]

2.2.6 Tobacco products for Oral Hygiene/ Dentifrices

There are numerous smokeless tobacco products available in the market e.g gudakhu, bajjar, creamy snuff and mishri which are primarily used for routine oral hygiene practices but gradually it becomes an addiction due to tobacco content. This marketing strategy is predominantly used by the companies due to the false belief of population that tobacco use is good for teeth.[22]

2.2.7 Gudhaku

It is a mixture made of tobacco, jaggery and catechu. Commercially it is manufactured and packed in tin cans or wrapped in saal leaves (*Shorea robusta*) of various sizes and weight. Prevalence of use of Gudakhu varies from 4-16% in states of Bihar, Odisha, Uttar Pradesh and Uttaranchal.[23] It is used as a dentifrice by applying to the teeth and gums by means of finger.

2.2.8 Mishri (Masheri or Misheri)

It is prepared by roasting tobacco on a hot metal plate till it becomes uniformly black and then making a fine powder of the roasted tobacco. It is usually used by women to clean their teeth by applying it to teeth and gums which may vary from once to several times a day. In a survey of 100,000 individuals in a rural area, 22% were mishri users; the prevalence was 39% among women and 0.8% among men.

2.2.9 Gul

Gul is prepared by finely powdered tobacco with some other indigenous ingredients. It is mostly used as a dentifrice by rubbing the powder to teeth and gums in eastern states of India. In the Global Youth Tobacco Survey (GYTS), gul use was reported by 6% in Bihar, 3% each in Arunachal Pradesh and Nagaland, 2% each in Assam, UP and Uttaranchal. In similar surveys of school personnel in northeastern states of India, female school personnel reported significantly higher gul use than males; Assam (13.5% vs (6.2% vs 1.4%) and Sikkim (46.5% vs 3.9%).[24]

2.2.10 Bajjar

Bajjar is dry snuff (also known as tapkeer) applied commonly by women in Gujarat on the teeth and gums. In a survey of 4844 women in Bhavnagar district, 14% reported using bajjar.

2.2.11 Lal dantmanjan

It is a red-coloured tooth powder containing tobacco, traditionally used as a dentifrice which is now being stopped in the market due to ban on tobacco as an ingredient of dental care products. Most of these dentifrices have an adverse effect on the hard tissue

of tooth e.g staining, mechanical damage to the tooth structure called abrasion due to coarse powder particles.

2.2.12 Creamy snuff

It is a paste like preparation which is being marketed in tubes like tooth paste. These products have gained acceptance with a false belief of antibacterial properties being considered healthy for teeth and gums. This practice seems to be popular with children in Goa.[25]

2.2.13 Tobacco water

Tobacco water is produced by passing tobacco smoke through water mainly by the house lady and the nicotine rich water is offered to sip as gesture to the guests and in the family. It is in vogue mainly in Mizoram (Tuibur) and Manipur (Hidakphu) which has been reduced now a days due to increased literacy rates and availability of commercially bottled tobacco water. Prevalence of about 7% tobacco water use reported in a study conducted in Aizawl and Churchandpur.[26]

2.2.14 Areca nut/Supari preparations

It is prepared by cutting dried areca nuts into bits and roasting them with or without fat to which flavouring, sweetening agents and condiments are added. Supari is marketed in attractive aluminium foil packs, in tins and in simple paper packets. Offering supari to guests, especially after meals, is a prevalent and well-accepted social custom in many parts of the country. It doesn't contain tobacco and therefore used by young children, adults and women who are non tobacco chewers without knowing the risk of its use.

2.2.15 Meetha mawa

Meetha (sweet) mawa consists of thin shavings of areca nut, grated coconut, dried fruits and other sweetening agents. It is used commonly in Gujarat and similar preparations with different names are used widely in other regions.

2.2.16 Nicotine chewing gum

It is a chewing gum containing nicotine in the range of 2-4mg available as an over the counter product in the market. It is used as a product to help quitting the use of smoking or smokeless tobacco. India's market size is growing in this sector and is targeted by the major tobacco companies along with the pharmaceutical companies.

3. Non-tobacco smoking products

Non-tobacco smoking products are also available. An herbal cigarette (brand name Nirdosh) and a herbal beedi (brand name Vardaan) is available in Indian Market. These products are marketed as aids to smoking cessation. No scientific evaluations have been carried out and little is known about their efficacy.

Summary

Tobacco is widely used across India in many forms which have deep rooted cultural acceptability. Bidi, Cigarette, Paan, Khaini and Guthka are the most popular and commonly used form of tobacco in India apart from numerous other regional variations in both forms of tobacco use. Spread of the tobacco epidemic "tobacosis" is a huge public health problem with serious consequences on the population that needs an appropriate, effective and comprehensive strategy to curb the tobacco use and its ill effects.

Unit Review Questions

1. What are the different smoking forms of tobacco used in India?
2. What are the different forms of smokeless tobacco used in India?

Application Question/ Assignment

1. Enumerate different types of tobacco use according to Geographical region, Socioeconomic status and cultures in India.

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Suggested Readings

1. Report on Tobacco Control of India, MoHFW, Govt of India 2004
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CHAPTER 3

HEALTH CONSEQUENCES OF TOBACCO USE

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Understand the process of deriving causal inferences from available evidence on tobacco
2. Enumerate the mechanisms of disease causation and addiction due to tobacco use
3. Describe the health consequences in relation to the patterns of tobacco use
4. Appreciate that tobacco leads to death
5. Describe the spectrum of diseases caused by tobacco use

KEY TERMS/DEFINITIONS

Attributable risk, health consequences, smoking, tobacco use, mechanisms of pathogenesis

1. Introduction

Globally, the disease consequences of tobacco use (smoking) have been more extensively and better documented than perhaps for any comparable risk factor. This is partly due to the fact that the tobacco industry kept on challenging the validity of the scientific findings for decades and also due to the large spectrum of the diseases caused by tobacco. Even now, as additional research findings become available, more and more diseases are getting linked to tobacco.

On January 11, 1964, Luther L. Terry, M.D., Surgeon General of the United States released 'Smoking and Health: Report of the Advisory Committee of the Surgeon General of the Public Health Service'. A series of reports published for the past 50 years since then have provided definitive synthesis of the evolving evidence on smoking and health (Figure 1) through a process of compilation of all relevant scientific evidence, critical assessment and evaluation of the strength of evidence (Box 1).

Box 1: Strength of causal inferences from available evidence

Four levels of hierarchy for classifying strength of causal inferences from available evidence[(1)]

1. Sufficient evidence to infer causal relationship
2. Suggestive but not sufficient
3. Inadequate evidence
4. Suggestive of no causal relationship

Figure 1: Changing levels of evidence over the years (1964 to 2014)[1]

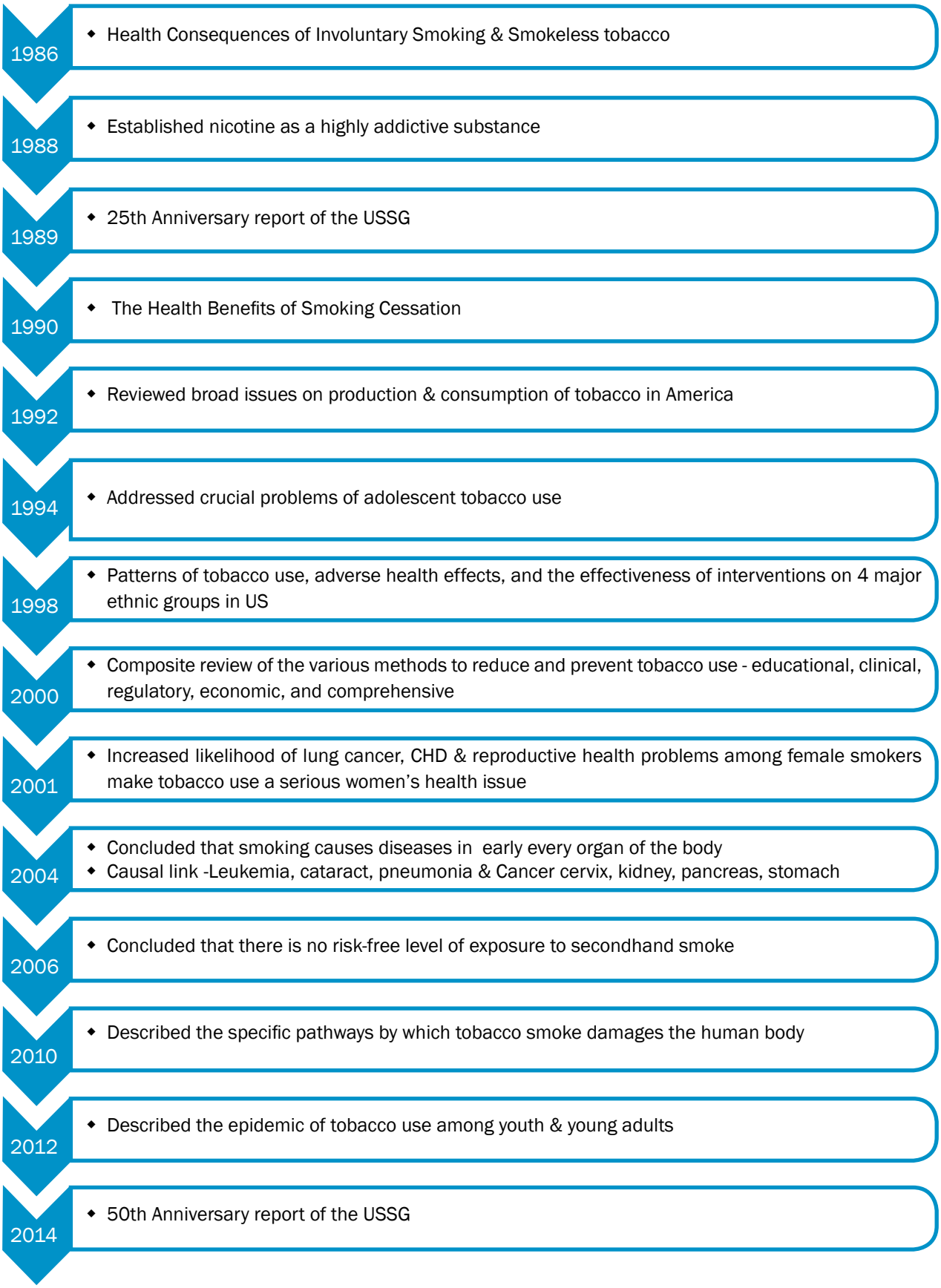

Figure 1: Changing levels of evidence over the years (1964 to 2014)[1]

Note: USSG= United States Surgeon General, LBW= Low birth weight, PVD= Peripheral vascular disease, CHD=Coronary heart disease, COLD= Chronic obstructive lung disease.

Box 2: Addiction to Tobacco Use

How does an individual become addicted to Tobacco use?

Addiction to tobacco products actually develops as a result of addiction to the Nicotine present in them, which causes a transition from occasional smoking to a sustained habit[1]. At this stage quitting becomes difficult and the individual falls prey to the deleterious effects associated with long term exposure to tobacco.

Nicotine can be directly or indirectly linked to all the health consequences of smoking due to its addictive nature[1]. Nicotine though not known to be a direct carcinogen, causes prolonged use of tobacco products due to addiction, which in turn exposes the individual to the carcinogens present in tobacco smoke. Nicotine also acts through different biological pathways in the human body resulting in the ill effects which are manifested in almost all organs of the body and in different forms ranging from fetal malformations to cancers.

2. Mechanisms of Addiction and Disease Causation due to Tobacco

Tobacco use causes serious diseases because, in addition to nicotine, tobacco contains several toxic and carcinogenic chemicals. Tobacco smoke contains 7000 chemical compounds of which 69 are known to be carcinogenic[1].Cigarette smoke also has co-carcinogens which, while not carcinogenic themselves, enhance the smoke's carcinogenic effects. Tobacco can cause diseases through various pathogenic mechanisms as shown in Figure 2.

Reference exposure levels (REL) are a guide to protect sensitive individuals against chronic effects over a long period of continuous exposure. Non-cancer risk indices (NCRI) for individual chemical constituents of mainstream cigarette smoke are based on a single cigarette per day. The NCRI is equal to reported concentration as a fraction of the REL, assuming a total volume of 20 m^3 of air breathed daily[2]. NCRI greater than 1.0 signals that the threshold for adverse effects could be reached for some people by smoking even a single cigarette per day.

Figure 3 shows the health consequences that are causally linked to smoking.

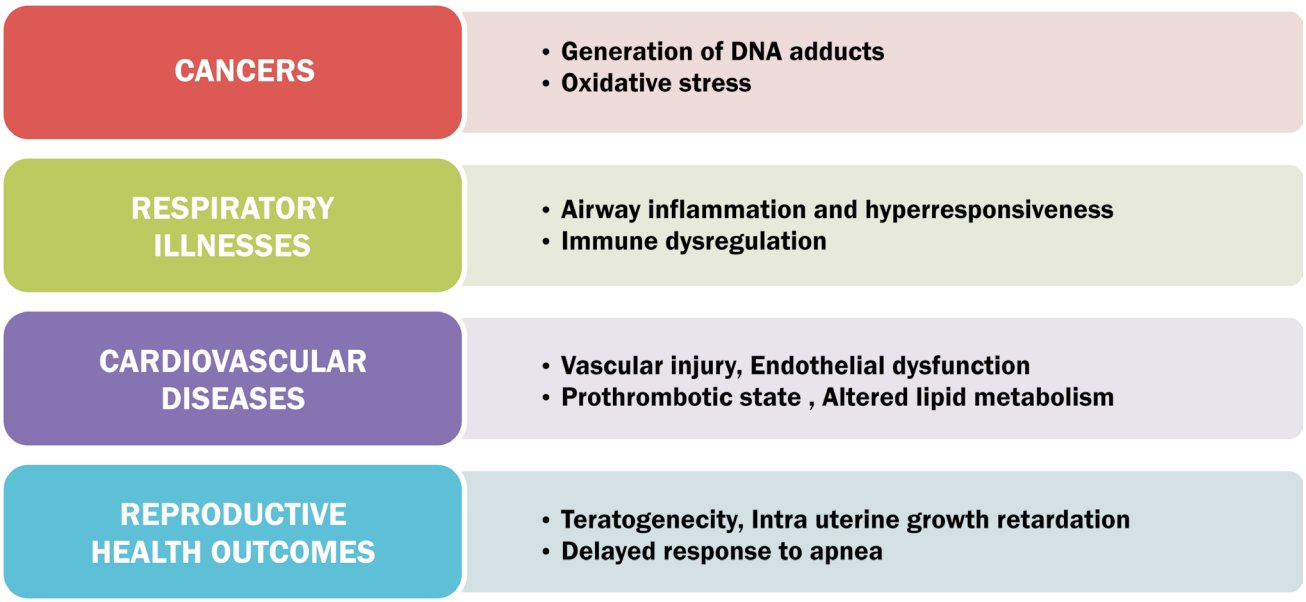

Figure 2: Pathogenic mechanisms of Tobacco [1]

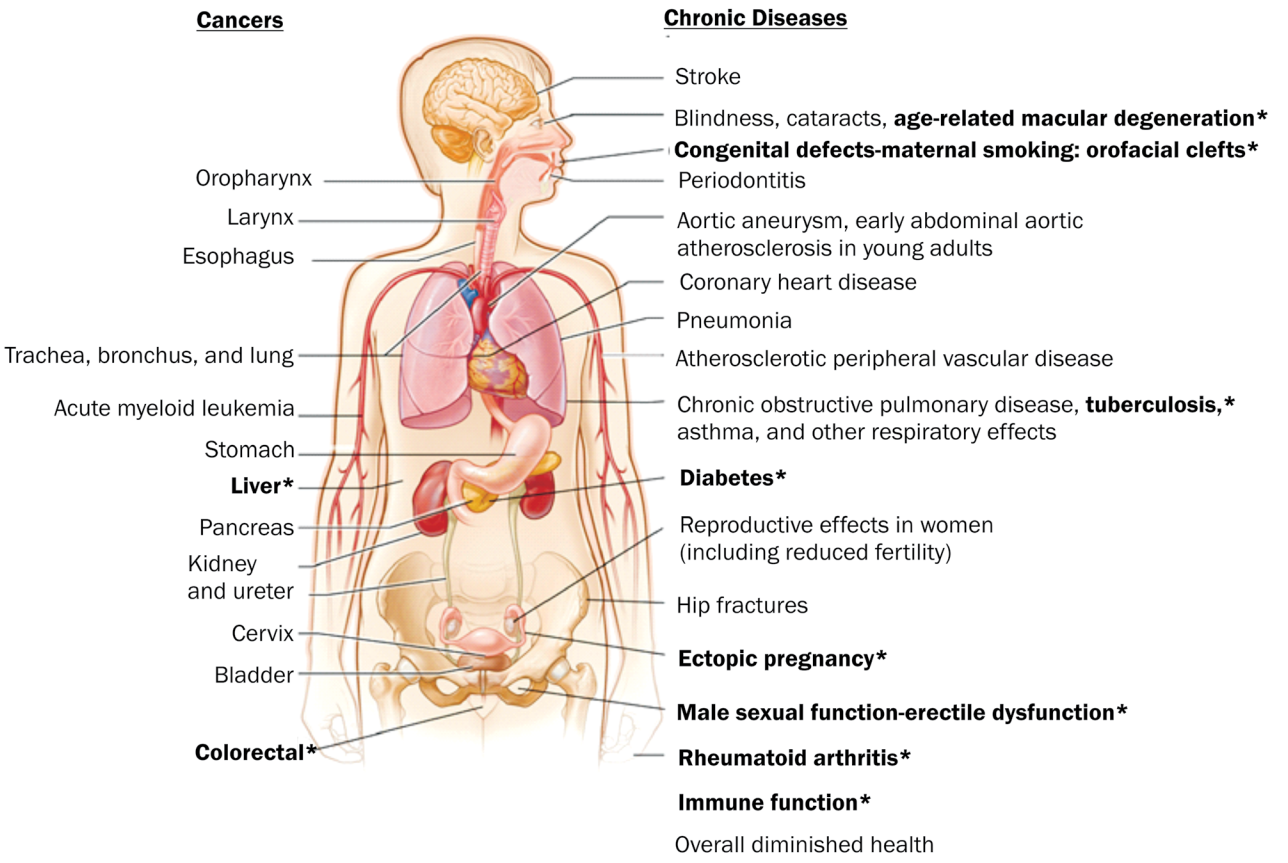

Figure 3: Health consequences causally linked to smoking

Source: USDHHS 2004, 2012

Note: Each condition presented in bold text and followed by an asterisk (*) is a new disease that has been causally linked to smoking in this report.

Box 3: Second hand and Third hand smoke due to Tobacco

Tobacco can deal unfair hands

First hand smoke: The smoke inhaled by the smoker as a result of his active smoking[3]

Second hand smoke (SHS): Composed of mainstream smoke and side- stream smoke. Mainstream smoke is the smoke inhaled and exhaled by the smoker. Side-stream smoke is the smoke from the burning end of the cigarette. **Passive smoking** is the term used for exposure to second hand smoke in non-smokers[3]. Health effects of second hand smoke are mentioned in Figure 4.

Third hand smoke: Refers to the residual smoke pollutants on dust, surfaces, clothes and human body after SHS has cleared. It can be re-emitted as gases as well as react with other pollutants such as nitrous acid to form tobacco-specific nitrosamines, some of which are carcinogenic[3].

3. Mortality due to Tobacco Use

The World Health Organisation (WHO) in 2008 released a statement that "Tobacco kills up to one in every two users"[4]. The higher absolute risks of deaths in two of three smokers have also been reported in few recent studies[3]. Excess mortality among smokers has been reported chiefly from diseases that can be caused by smoking - cancers of the mouth, oesophagus, pharynx, larynx, lung, pancreas, and bladder; COPD and other respiratory diseases; vascular diseases and other related conditions like peptic ulcer, cirrhosis, suicide, and poisoning[1,5,6].

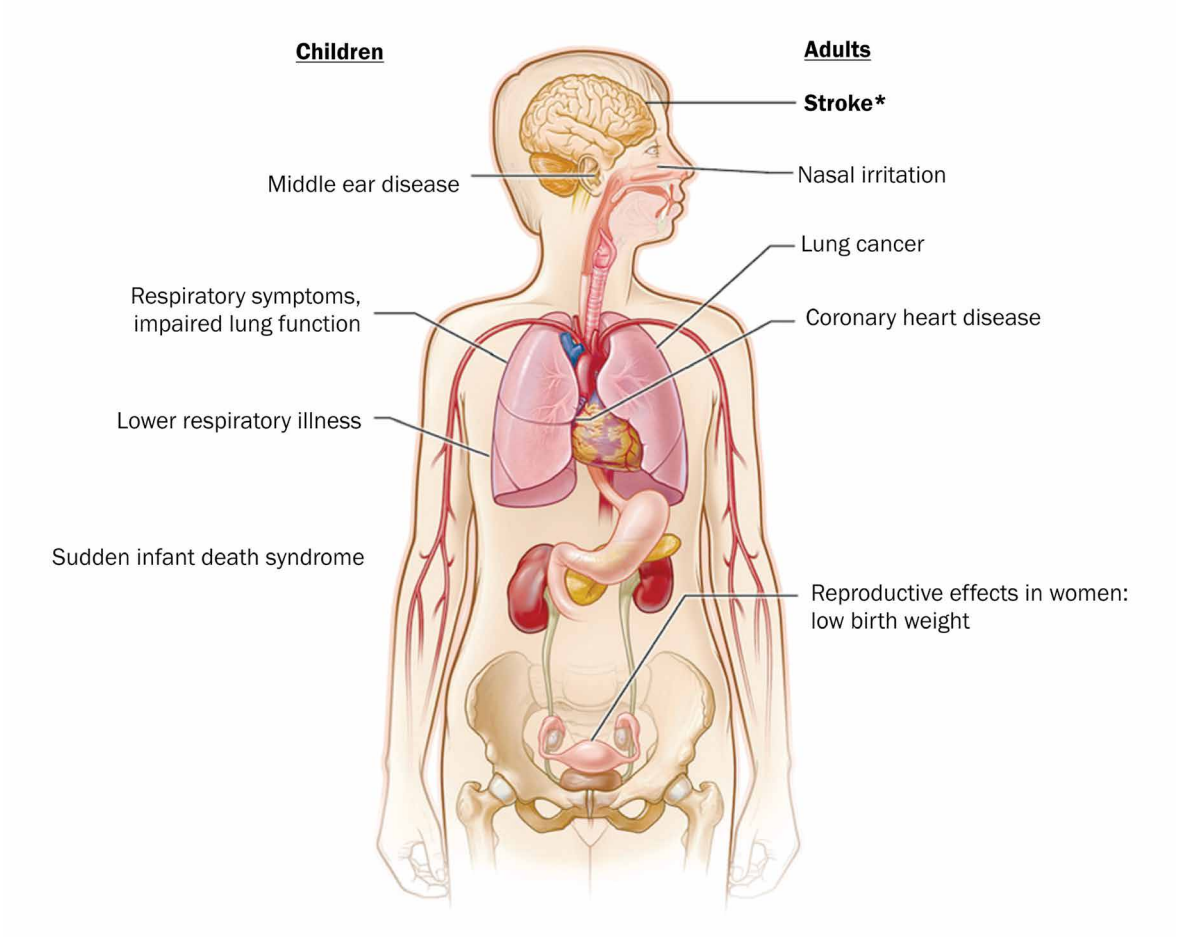

Figure 4: Health consequences causally linked to exposure to second hand smoke

Source: USDHHS 2004, 2006

4. Spectrum of Diseases Caused by Tobacco Use

1. **CANCER:** The ill effects of tobacco were first publicized in the context of cancer. Over the decades, causal relationships have been established between tobacco use and malignancies of the oropharynx, larynx, esophagus, trachea, bronchus, lung, stomach, pancreas, kidney, ureter, cervix, bladder and acute myeloid leukemia[1].

- **Lung Cancer:** Early research on types of lung cancers associated with smoking revealed that squamous cell carcinomas were most common among smokers. However, in recent years a rising trend of adenocarcinomas of the lung is being reported among smokers[1]. It is theorized that squamous cell carcinomas show a more rapid decline when compared to adenocarcinomas with the advent of tobacco cessation measures. This is one of the possible reasons for the rise in adenocarcinomas. The other reasons include introduction of cigarettes with ventilated filters which have lower yields of tar and nicotine, however the evidence for this is not sufficient.
- **Oral cancers:** Oral cancers are of particular relevance to the Indian context owing to the fact that majority (74%) of tobacco use in India is in the form of chewable forms of tobacco[8]. There are differences in the nature of effects of bidi and cigarette smoking. For instance, cancer deaths due to cigarette smoking are primarily related to lung cancer, which accounts for over 70% of tobacco-related cancer deaths and a third of all cancer deaths in the USA. In India, where bidi smoking and tobacco chewing are common habits, the major effects of tobacco are seen in the oral cavity, pharynx and oesophagus, which together account for a large proportion of tobacco-related cancers[6].
- **Liver cancer:** There is sufficient evidence to infer a causal relationship between hepatocellular carcinoma and smoking[1]. Liver being the primary site for metabolism of many of the known carcinogens in tobacco smoke is susceptible to

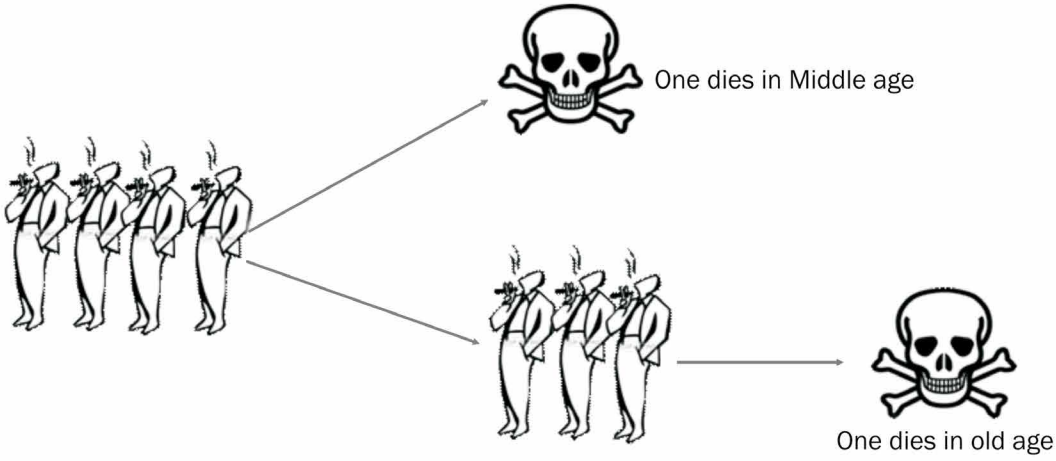

Figure 5: Smoking kills one in two smokers

Source: Adapted from the Oxford textbook of Global Public Health[3] and Doll et al(1994)[7]

Box 4: Health outcomes in Cancer patients

There is sufficient evidence to infer a causal association between smoking and adverse health outcomes among cancer patients like

1. Effects on tumor (accelerated growth, progression, metastasis, second primaries & recurrence)
2. Response to treatment (like toxicities or resistance)
3. Susceptibility to diseases which may affect response
4. Overall survival or mortality[1].

Evidence to implicate smoking with adverse outcomes like recurrence, poor response to treatment and treatment related toxicity suggestive but insufficient[1].

their carcinogenic effects. If smoking increases in low-and middle-income countries, then the potential for reducing liver cancer from preventive interventions like vaccination against HBV or reductions in exposure to aflatoxin will not be fully realized.

- **Colorectal cancer:** Smoking has been found to cause an increased formation of adenomatous polyps in the intestine, which are precursors of colorectal cancer. The evidence for associations between colorectal cancers and smoking is relatively new and considered sufficient[1]. Evidence indicates that cigarette smoking may be a modifiable risk factor for colorectal cancer. Accordingly, clinicians and public health personnel should include both current and former smoking as potential risk factors for this disease.
- **Other cancers being explored:** At present, there is sufficient evidence to identify mechanisms by which smoking can cause ***breast cancer***[1]. However, there is insufficient evidence to conclude an increased risk due to exposure to either active or passive tobacco smoke with breast cancer in women[1]. Though no causal relationship has been proven between tobacco and prostate cancer, evidence is suggestive of a higher mortality from prostate cancer in smokers than in nonsmokers[1].

2. RESPIRATORY ILLNESS

- **Chronic obstructive pulmonary disease:** The concept of permanent airflow obstruction is central to diagnosis of COPD and the clinical phenotypes may include chronic bronchitis, emphysema, asthma and other chronic obstructive conditions of the lung. COPD is characterized by irreversible damage to lung tissue. There is sufficient evidence that smoking has causative role in all

clinical phenotypes of COPD[1]. With increasing trend of smoking being observed among women, gender specific manifestations of COPD are being studied. Mortality due to COPD has dramatically increased in both men and women, and the mortality in women is higher than that in men[1]. Evidence suggests that women may be susceptible to developing more severe COPD at a younger age[1].

- **Asthma:** In children and adolescents, the evidence is suggestive but not sufficient to infer a causal relationship between active smoking and incidence or exacerbation of asthma. However, the evidence is sufficient to infer a causal relationship between active smoking and exacerbation of asthma in adults[1].
- **Tuberculosis:** Biologic evidence supports the plausibility of increased risk for TB infection among smokers because tobacco smoke has been shown to cause mechanical disruption of ciliary function, alter mucociliary clearance in the airways, and inhibit macrophage responses, thus increasing the likelihood that M. tuberculosis organisms reach the alveoli where TB infection begins. Sufficient evidence is available to infer a causal relationship between active smoking and clinical disease[1]. Evidence also suggests an increase in the risk of recurrent disease and mortality among smokers. In India, tuberculosis is the leading cause of mortality among smokers[9,10].
- **Idiopathic Pulmonary Fibrosis:** At present, the evidence is suggestive but not sufficient to infer a causal relationship between cigarette smoking and IPF[1].

3. **CARDIOVASCULAR DISEASES** Key aspects of pathogenesis of smoking-induced heart disease include (1) endothelial dysfunction, (2) a prothrombotic effect, (3) inflammation, (4) altered lipid metabolism, (5) increased demand for myocardial oxygen and blood, and (6) decreased supply of myocardial blood and oxygen. Newer studies have linked more components of cigarette smoke with pathogenic mechanisms.[1]

- **Coronary Heart Disease:** The 2006 Surgeon General's report provided evidence that exposure to second hand smoke increases the risk of CHD in exposed nonsmokers. In addition, it provided the first evidence that very low levels of exposure have disproportionate effects on CHD risk and the risk flattens out at higher levels of cigarette consumption, indicating that the dose-response relationship for smoke exposure and CHD is nonlinear[1].
- **Cerebrovascular disease:** Recent evidence is sufficient to infer a causal relationship between exposure to second hand smoke and increased risk of stroke. The estimated increase in risk for stroke from exposure to secondhand smoke is about 20–30%[1].
- **Aortic aneurysm:** Smoking is known to predispose individuals to early onset of aortic injury and damage to elastin tissue which can lead to aneurysms[1].
- **Peripheral Artery Disease (PAD):** Cigarette smoking has been a well-established risk factor for diseases like Thromboangiitis Obliterans. Recent evidence has established a strong dose response relationship between number of cigarettes smoked and risk of developing a PAD[1].

4. **REPRODUCTIVE HEALTH OUTCOMES:** Use of tobacco can cause complications during pregnancy (like spontaneous abortion, ectopic pregnancies), adverse perinatal and fetal outcomes (IUGR, stillbirths) and long term effects on the growth and development of the child[1].

- **Ectopic pregnancies:** There is sufficient evidence that components of tobacco smoke impair fallopian tube function, resulting in the retention of the embryo in the tubes, causing an ectopic pregnancy[1].
- **Spontaneous abortion:** Though mechanisms like smoking induced uterine dysfunction, fetal hypoxia, placental insufficiency and improper embryonal attachment have been suggested as a cause of spontaneous abortion, the evidence is not sufficient to infer a causal relationship between maternal active smoking and spontaneous abortion[1].
- **Fetal growth:** It has been established for many years now that active smoking in the mother as well as exposure to second hand smoke is associated with preterm births, Intrauterine Growth Restriction (IUGR)and low birth weight in the fetus[1].
- **Stillbirth and Perinatal mortality:** Smoking likely increases perinatal mortality through numerous mechanisms, including abortion, placenta previa, preterm delivery, and premature and prolonged rupture of the membranes, and through physiologic responses of the fetus and newborn to stress. Cigarette smoking was consistently associated with stillbirth (increased risk of 40% to 60%), increased Neonatal mortality (by 20%) and Perinatal mortality (by 20–30%)[1].Nicotine may predispose infants of smokers to Sudden

Infant Death Syndrome (SIDS) by impairing their response to hypoxia and delaying arousal states. However a causal relationship has not been observed [1].

- **Congenital malformations:** Maternal smoking could interfere with normal organ development in offspring through fetal hypoxia, alterations in essential nutrients, teratogenic effects, and DNA damage. Available evidence is sufficient to infer a causal relationship between maternal smoking in early pregnancy and orofacial clefts[1].The evidence is suggestive but not sufficient to infer a causal relationship for defects like clubfoot, gastroschisis, and atrial septal heart defects[1].
- **Neurobehavioral Disorders of Childhood:** The evidence is suggestive but not sufficient to infer a causal relationship between maternal prenatal smoking and disruptive behavioral disorders, and attention deficit hyperactivity disorder in particular, among children[1]. Prenatal exposure to tobacco smoke and disorders like oppositional defiant disorder, conduct disorder, anxiety disorders, depression, Tourette syndrome, schizophrenia, and intellectual disability are being examined; however there is insufficient evidence to derive a causal association[1].
- **Other reproductive outcomes:** There is sufficient evidence to infer a causal relationship between smoking and erectile dysfunction[1]. Nicotine pharmacologically induces vasospasm of penile arteries, thus altering the dynamics of the local blood flow required for erection.

5. OTHER HEALTH OUTCOMES

- **Diabetes:** The risk of developing diabetes is 30–40% higher for active smokers than nonsmokers[1]. Also, a clear dose response relationship exists between the number of cigarettes smoked and the risk of developing diabetes[1]. Smoking is associated with an increased risk of obesity which in turn is a well-established risk factor for insulin resistance and diabetes. The inflammatory response and endothelial dysfunction occurring as a result of oxidative stress induced by smoking is also known to cause insulin resistance. Further, it has been reported that diabetics who smoke have higher insulin requirements[1].
- **Immune function and autoimmune disease:** Tobacco smoke is a largely known to be a pro inflammatory substance. In addition, some components have also been demonstrated to have an anti-inflammatory effect. This combination of effects leads to paradigm of acute on chronic cumulative damage. The adverse effect of smoking on immunity is known to be associated with increase in incidence of diseases like COPD, pneumonia, viral influenza and several bacterial infections. Smoking cigarettes is a risk factor for developing a number of autoimmune diseases, including
  - Rheumatoid arthritis (RA) - causal role
  - Systemic Lupus Erythematosus (SLE)
  - Multiple sclerosis
  - Graves' hyperthyroidism
  - Primary Biliary Cirrhosis[1]
- **Age-Related Macular Degeneration (ARMD):** The evidence is sufficient to infer a causal relationship between cigarette smoking and neovascular and atrophic forms of age-related macular degeneration[1].
- **Dental caries:** Suggestive evidence that associates smoking with dental caries and failure of dental implants is available but it was not sufficient to infer a causal relationship[1].

Box 5: Green Tobacco Sickness among Tobacco Harvesters

How does Tobacco harm its cultivators and harvesters?

Tobacco leaves grown in the field in their uncured state are called "Green Tobacco". Green Tobacco Sickness (GTS) is an occupational illness seen among workers who handle green tobacco[6]. It is caused by the absorption of nicotine from wet tobacco plants through the dermal route. Abrasions sustained by workers during the different stages of tobacco production which damages the intactness of their skin facilitates absorption of nicotine.

Manifestations: GTS manifests as an acute illness occurring several hours after continuous exposure to green tobacco leaves. The illness lasts for 12-24 hours and is characterized by headache, nausea/vomiting, giddiness, loss of appetite, fatigue, weakness and, sometimes, fluctuations in the blood pressure or heart rate. It is a self-limiting condition. Though it is not known to cause death, it has been reported as a cause of absenteeism and loss of wages among the workers[6].

Summary

The century-long epidemic of cigarette smoking has caused an enormous avoidable public health tragedies. Compilation of all relevant scientific evidence, its critical assessment and evaluation has led to the evolving evidence on smoking and health. Tobacco smoke, containing 7000 compounds, of which 69 are known to be carcinogenic, can cause serious diseases through various pathogenic mechanisms. Excess mortality among smokers - up to one in every two users, is mainly due to cancers, respiratory and vascular conditions related to tobacco use. Higher absolute risks of deaths in two of three smokers have also been documented. Exposure to second hand tobacco smoke has been causally linked to cancer, respiratory, and cardiovascular diseases, and to adverse effects on the health of infants and children. Cigarette smoking has been causally linked to diseases of nearly all organs of the body, poor health status, and harm to the fetus. Research continues to newly identify diseases caused by smoking, including such common diseases as diabetes mellitus, rheumatoid arthritis and colorectal cancer.

Unit Review Questions

1. Describe briefly the pathogenic mechanisms of tobacco in causation of various diseases.
2. What are the health consequences that are causally linked to smoking and tobacco use?
3. List the health consequences that are causally linked to exposure to second hand smoke.
4. Mention the various cancers caused by tobacco use, as per available evidence.
5. How does tobacco affect the respiratory & cardiovascular systems of the human body?

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CHAPTER 4

SOCIO-ECONOMIC IMPLICATIONS OF TOBACCO USE

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Understand the relationship between tobacco use, development and poverty
2. Explain the socioeconomic inequalities in tobacco use as well as the socioeconomic impacts of tobacco consumption.

KEYWORDS

Inequalities, poverty, socioeconomic development, smoking, tobacco use

1. Introduction

Tobacco causes millions of death each year and the contribution of tobacco to premature death and disease is well documented. By 2030, it is expected to kill 10 million people per year globally and developing countries will account for a major portion of these deaths. Half of these deaths will be among those in middle-age (35–69 years old) leading to harmful effects on national economies.(1) Countries still fighting the infectious diseases traditionally associated with low incomes now increasingly face the added burden of non communicable diseases of which one of the important determinant is exposure to tobacco.(2) The nationwide Million Deaths Study in India concluded that smoking is responsible for about 1 in 20 deaths of women and 1 in 5 deaths of men respectively in persons between 30 to 69 years of age and that excess deaths among smokers was chiefly from tuberculosis.(3)

However, tobacco is not just a health issue but beyond that, it is a developmental issue with long reaching economic and social consequences. Tobacco is a threat to sustainable development by affecting its 3 main pillars- environmental sustainability, economic development, and social inclusion and the control of tobacco is an important issue in the attainment of Millenium Development Goals.(4) At this juncture, it should also be emphasized that tobacco related diseases are entirely preventable and that the global tobacco pandemic is rapidly moving to developing nations; thus tobacco use and its control is a matter of global concern.

2. Social determinants of health and tobacco

The social determinants of health are the circumstances in which people are born, grow up, live, work and age, and the systems that exist to deal with illness. These circumstances are in turn affected by economics, social policies, and politics. Health inequities are inequities in health between people within and between countries which are both unjust and avoidable. One of the important determinants of

these inequities is exposure to tobacco and its use is the single greatest driver of avoidable mortality with vast inequities across socioeconomic status.[5]

Thus a "health in all policies" approach is essential to link between health and broader economic and social policies. Governance which is transparent and accountable acts on these social determinants that reduces inequities is essential for improving health. In this context the WHO calls for signatory governments to implement measures for tobacco control under its Framework Convention for Tobacco Control (WHO FCTC).[6] Under the Rio political declaration on social determinants of health to strengthen global governance, reducing tobacco consumption has been recognized as an important contribution to addressing social determinants of health and vice versa.[7]

3. Tobacco and poverty–a vicious cycle

There is an "inextricable" and "pernicious" relationship between tobacco and poverty. In many ways, tobacco and poverty/ social disadvantage are part of the same vicious cycle (Figure 1) wherein tobacco tends to be consumed by those who are poorer and the neglected sections of the society and in turn, it contributes to poverty through loss of income, loss of productivity, disease and death (Table 1). It is the poor and the poorest who tend to smoke the most.[8]

Furthermore, there are costs to smokers that go far beyond the money that they pay to buy cigarettes and other tobacco products. Smokers develop many more illnesses than non-smokers, which places enormous cost stress on any country's health care expenditures borne at government as well as individual levels and their families and makes it more difficult to afford health coverage. Also, smoking-related illness takes workers out of the workforce, thereby adds to the indirect costs of tobacco creating further downward pressure on the economy, especially in LMICs.[8] [9]

3.1 Socioeconomic inequalities in tobacco use

There is a significant association between socioeconomic position and prevalence of tobacco use. Nearly two-thirds of the poorer countries for which there are data, have male smoking rates above the present average in the developed world, which is 35%.[9] The systematic review and meta analysis of the link between tobacco and poverty by WHO in 2005 demonstrated an inverse relationship between income level and tobacco use prevalence, particularly in the last two decade. There was a consistently higher prevalence of use among the poorest in both genders and an increased susceptibility to tobacco related illnesses in low income groups, especially in case of all cause mortality, lung diseases and low birth weight. This study found that the low income level group had a statistically significant greater odds ratio of smoking than the high income level group: OR of smoking 1.415 (95% CI 1.276–1.569).[2] It has also been seen that in the lower income countries, including India, the differences in smoking prevalence between rich and poor were greater than in the high income countries.[10]

Figure 1: Relationship of Social disadvantage and poverty with Tobacco Smoking [8]

Table 1: Relationship between poverty and tobacco[8]

1.	**Social disadvantage and deprivation in poverty leads to**
	• Adverse circumstances (unemployment, single parenthood)
	• Stress and isolation
	• Unsafe neighborhoods and violence
	• Smoking/ tobacco use being accepted as "normal" phenomenon
	• Limited avenues for recreation or leisure
2.	**Creates vulnerability to use of tobacco**
	• As a means of coping with difficult life circumstances
	• As recreation which is "affordable"
	• As a response to stress, isolation and exclusion
3.	**Tobacco use prevalence increases**
	• Less attempts at quitting
	• Higher relapse rates
4.	**Smoking and tobacco use makes circumstances worse**
	• Less money for essentials including food and education
	• Greater financial stress due to spending on tobacco or health expenditure due to tobacco related illness
	• Poorer health and wellbeing

The explanation for this phenomenon has been sought by several experts. The Four Stages model of the smoking epidemic has been put forward and widely accepted (Figure 2). In this model, in the earlier stages of the tobacco epidemic, male prevalence and per capita consumption of cigarettes is comparatively low and smoking disseminates among higher income groups who are more open to innovation and have better access. During the intermediate stages, smoking diffuses to the rest of the population and the prevalence among females lags behind that of males, prevalence may be similar in different socioeconomic classes. Later, smoking prevalence declines for both sexes and it declines among the high income level strata, with better awareness about the harms of smoking and adoption of healthier lifestyles and fitness regimes. Only after a long history of cigarette consumption, when all SES groups have been similarly exposed to smoking, does the inverse social status gradient emerge.[2]

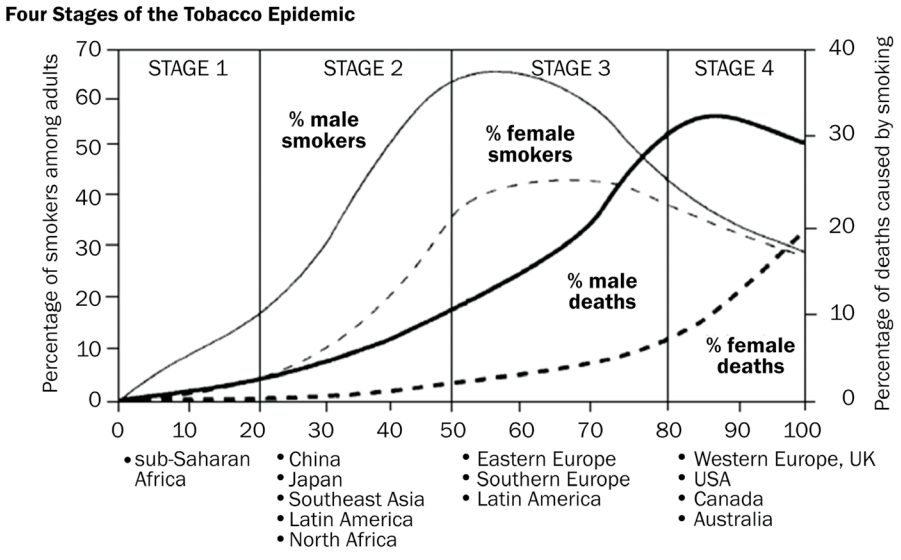

Figure 2: Four Stages of the Tobacco Epidemic [11] [12]

In a review article to study the social and economic implications of non-communicable diseases in India, the authors explained in detail regarding the growing epidemic of Non communicable diseases and the dual burden faced by India due to the epidemiological transition. They have also attempted to explain the pathways through which NCDs and lifestyle disorders vary with respect to prevalence as well as its impact in terms of health outcomes in different socioeconomic strata. Socioeconomic status has direct effect on health through material, psychosocial and behavioural factors. Specifically, it has also been found in this review that health damaging behaviours including smoking and tobacco use are higher among the lower socioeconomic groups while simultaneously the uptake of a 'universal' prevention programme is lower among them (Inverse Care Law). These personal behaviours are in turn influenced by social determinants.[13]

What is even more interesting and of concern is that regardless of country income, individuals at the poorer end of the socioeconomic scale, variously defined by income, education or profession, were more likely to smoke than their more affluent counterparts. (Box 1) In an attempt to explore this, WHO states that, tobacco consumption is a complex problem and may simultaneously be an addiction, used for pleasure seeking as well as be a marker of social status. It may be consumed in many forms as a replacement for the expensive things the poor cannot afford.[9] They may perceive tobacco as a "reward", as a pleasurable thing that they can do for themselves. Another theory 'is a higher' physiological addiction to nicotine among poor people as measured by higher nicotine metabolites.[10]

Social gradient also affects success in quitting, as high socioeconomic status people are more likely to stop smoking. Other factors like changes in marketing, industrialization, communication, country specific policies on tobacco pricing and innovation also affect the acceptance, patterns and practices of tobacco consumption in the population. The synergistic and complex effect of smoking and poverty on health may further be explained by several factors like lack of access to tobacco damage information and adequate health coverage, insufficient personal and social self-care, low nutrition level, poor housing, presence of occupational hazards etc, among the lower socioeconomic groups.[2]

Box 1 (Case Study) : Socioeconomic Inequality in the Prevalence of Smoking and Smokeless Tobacco use in India [14]

The analysis of Indian Global Adult Tobacco Survey (GATS) was performed by the authors in 2014 to predict the impact of socioeconomic determinants on both forms of current tobacco consumption while adjusting for other socio-demographic variables according to zones- North, Northeast, Central, South, East and West regions of India. Higher consumption of both the forms was observed in poorest and poor quintiles when compared to the rich and richest quintiles. The risk of tobacco consumption among the poorest compared to the richest quintile was 1.6 times higher for smoking and 3.1 times higher for smokeless forms. Thus poverty was a strong predictor for smoking and in all regions for smokeless tobacco use in India. Similar pattern was seen in most of the states in India. It was concluded that poverty and poor education are strong risk factors for both forms of tobacco consumption in India.

Another analysis of the Global Adult Tobacco Survey [15] to determine inequalities in tobacco consumption with respect to socioeconomic status across various states of India found significant difference in odds of smoking with the wealth quantiles and a decreasing odds of tobacco consumption with increasing wealth was seen in most of the states except in Nagaland.

Both the studies point to the conclusion that for better control of NCDs and for tobacco control policies to be effective, it is necessary to address the socioeconomic inequalities in both the prevalence of tobacco use across the different socioeconomic groups.

Table 2: Tobacco's cost to governments, and national economies [16]

1. Social welfare and health care spending
2. Absenteeism and decreased productivity among the tobacco consumers
3. Loss of foreign exchange in importing cigarettes;
4. Loss of land that may be used to grow food;
5. Costs of fires and damage to buildings;
6. Environmental costs due to deforestation or collection of tobacco related waste
7. Higher numbers of tobacco related accidents and higher insurance premiums

Table 3: Relationship between tobacco use and MDGs [19]

Millennium Development Goal	Impact of Tobacco
Goal 1 Eradicating extreme poverty and hunger	◆ Mortality due to tobacco is most often among the primary wage earner in the family ◆ Expenditure on tobacco may supersede other essential expenses ◆ High health costs related to NCDs burden health care and social services ◆ Smoking related deaths t end to occur in the most productive middle-age years
Goal 2 Achieve universal primary education	◆ Impoverished families need to find employment for all household members, including children ◆ Child labor in the tobacco industry impedes ability to attend school ◆ Non-fatal and fatal effects of secondhand smoke affect children's development, which affects educational attainment.
Goal 3 Promote gender equality and empower women	◆ As smoking rates among women increase, so do tobacco-related diseases including those that primarily affect women ◆ Health care expenditure related to tobacco use reduces investment in programs and policies to reduce gender inequity
Goal 4 & 5 Reduce child mortality and improve maternal health	◆ Perinatal smoking endangers the health and lives of both mother and child ◆ Secondhand smoke results in adverse health consequences
Goal 6 Combat HIV/AIDS, malaria and other diseases	◆ Evidence suggests smoking has an effect on the immune system, as well as potential synergistic effects on respiratory infections ◆ Smoking is associated with TB treatment failure and relapse
Goal 7 Ensure environmental sustainability	◆ Tobacco production results in deforestation ◆ High use of agrochemicals (fertilizers and pesticides) affects other agricultural crops and rivers and watersheds

3.2 Impact of tobacco on socioeconomic development and MDGs

The economic consequences of tobacco use are both direct (primarily in the form of higher healthcare costs) and indirect (related to productivity losses as a result of morbidity and premature mortality) as given in table 2.

Globally under the Tobacco Free Initiative, the data on tobacco surveillance and monitoring including its determinants and consequences is collected by the member countries through the WHO Framework Convention on Tobacco Control (WHO FCTC) using scientific and evidence-based protocols. This Global Tobacco Surveillance System (GTSS) consists of mainly four surveys: Global Youth Tobacco Survey (GYTS), Global School Professionals Survey (GSPS),

Global Health Professions Students Survey (GHPSS) and Global Adult Tobacco Survey (GATS). Policy monitoring results are reported in the periodic WHO Report on the Global Tobacco Epidemic while the results of the health outcome monitoring are reported in the WHO global report on mortality attributable to tobacco.[17] It also gives data on tobacco economics and measures the costs of tobacco use in its enormous toll of disease, suffering and family distress.[18]

Macroeconomic impacts

Tobacco is directly and indirectly linked to all the Millenium Development Goals as given in Table 3. Poor nutrition among the communities suffering from higher burden of tobacco use increases infant and maternal mortality and adversely affects education by decreasing the chances that older children may succeed at school. If more money is spent on tobacco than on education, there is less chance that children, especially girls, will be sent to school. Tobacco users are more likely to fall ill or die from respiratory illnesses, heart attacks, cancers and other illnesses.[9] Furthermore, tobacco farming negatively affects environment by causing deforestation due to land clearance, soil erosion and river sedimentation, ecosystem disruption, species extinction and climate change.

Scientists have postulated that the expenditure incurred due to tobacco related diseases is much more than the revenue that may be generated from tobacco as presented by the report generated by Indian Council of Medical Research (ICMR) which suggested a nationwide expenditure of Rs. 1.94 billion by the patients of tobacco-attributable cancers diagnosed in 1990, for their treatment. They estimated the total direct and indirect costs due to three major tobacco related diseases using the consumer price index for 1999 to be Rs.277.61 crore (USD 6.2 billion) out of which 83.7% was due to premature death.[20][21] In 2011, a report on "Economic Burden of Tobacco Related Diseases in India", supported by the Ministry of Health & Family Welfare, Government of India and the WHO Country Office for India was released which estimated direct and indirect costs from diseases of tobacco use namely, respiratory diseases, tuberculosis, cardiovascular diseases and cancers. The total economic costs attributable to tobacco use from all diseases in India in the year 2011 for persons aged 35-69 amounted to Rs. 1,04,500 billions (USD 22.4 billion) which is 1.16% of GDP and 12% more than the combined state and central government expenditure on health care in 2011 with the direct costs of Rs 16,800 crores (USD 3.6 billion) and indirect costs of Rs 14, 700 crore (USD 3.1 billion). The cost from premature mortality was estimated as Rs 73,000 crores (USD 15.6 billion) [22] Similarly, a study in 2010 [23] attempted to quantify the impact of tobacco use on poverty in India where it was estimated that accounting for direct expenditure on tobacco would increase the rural and the urban poverty rates by 1.5% (affecting 11.8 million people) and 0.72% (affecting 2.3 million people), respectively. They concluded that tobacco consumption impoverishes roughly 15 million people in India and hence tobacco control measures would not only improve public health, but alleviate poverty in India.

Microeconomic impacts

Many studies have shown that poorest household in some low and middle income countries have more than 10% of total household expenditure on tobacco. This means that these families have less money to spend on such basic items as food, education and health care.[24] The adverse effects are mainly seen among the vulnerbale groups- that is children (as given in Case study 2) and women. Inadequate nutrition for mothers also causes poor pregnancy outcomes as well as increased susceptibility to infectious diseases, including HIV/AIDS and tuberculosis. These effects are especially severe when a breadwinner in a poor family falls prey to tobacco related illness. When he/she becomes too ill to work, the family's food and income supplies further reduce or stop. Paying for treatment also leads to further impoverishment, and may force them to sell their possessions, push them down the poverty line. These effects are compounded by the fact that their acces to medical care is often poor and hence their chances of recovering from the illness are lessser.[25]

Misconceptions about socioeconomic impact

Several governments have in the past raised concerns that tobacco control measures would have negative economic consequences due to lower tax revenues and increased illicit activities; decreasing employment in the manufacturing, farming and retail sectors; and impoverishing smokers with higher prices. However, existing evidence from developed countries and emerging data from developing countries show that these fears are largely unfounded (World Bank, 1999)[27]. The employment and trade benefits of

Case study 2: Hungry for tobacco: an analysis of the economic impact of tobacco consumption on the poor in Bangladesh [26]

The available statistics of tobacco and socioeconomic impact in Bangladesh revealed that an average Bangladeshi male cigarette smoker spends more than twice as much on cigarettes as per capita expenditure spent on clothing, housing, health and education combined. Spending per household on tobacco accounts in rural areas for 1.3% of total household expenditure with, 3.3% for urban areas, or 1.4% for the country as a whole. Also, male smoker if quits, the daily expenditure thus saved could add over 500 calories to the diet of one or two children. Furthermore, hypothetically, if all poor male tobacco users in Bangladesh were assisted to give up tobacco, and were to put 70% of their freed-up income into food this would provide enough additional calories to save 10.5 million Bangladeshi children from malnutrition.

tobacco to developing countries have been overstated by the tobacco industry in an attempt to deflect sensible regulation. It is also important to remember that tobacco employment is not sustainable, it does not provide workers with safe, sustainable, or poverty-reducing livelihoods. Instead, tobacco employment involves meagre wages or financial return, debt, exposure to dangerous chemicals and hazardous working conditions, the use of child labour, and other human rights abuses.[28]

3.3 Role of tobacco interventions in poverty reduction and development

Tobacco control has been recognised as affordable and effective for almost all countries and as one of the Best Buy to tackle NCDs, While significant advances have been made and continue to be made in tobacco control internationally, including in low-income countries, significant gaps had remained in the past due to the lack of understanding of tobacco control as an important development issue and regarding its links to poverty reduction. However this has been changing as there is a growing recognition of the need to include tobacco control as an aspect of development policy, The challenge now remains as to how to bring the two elements of tobacco control and development together.[29]

The United Nations Development Programme (UNDP) which is playing a central role in the implementation of the MDGs has identified that a health systems strengthening approach and universal health coverage are salient and potentially useful avenues for countries seeking accelerated implementation of the WHO FCTC, through both a multisectoral and preventative approach. Similarly United Nations Economic and Social Council (ECOSOC) that supports an Ad Hoc Inter-Agency Task Force on Tobacco Control also reiterated the link between economic development and poverty reduction, and argued for the ill-effects of tobacco use to be addressed as a development priority.[30]

Also, while developing and implementing policies for tobacco control, it is necessary to focus on equity approach and address the socioeconomic differences in tobacco use discussed earlier in the chapter. Hill S et al[31] in their systematic review conducted in 2015 concluded that there is strong evidence for increases in tobacco price to have a pro-equity effect on smoking behaviour. Other tobacco control measures are unlikely to help reduce inequalities in smoking without specific efforts to make these more accessible and effective for disadvantaged smokers. They emphasized on the need for more research evaluating the equity impact of population-level tobacco control measures, particularly multi-faceted approaches and those targeting less advantaged communities. Similar results have been seen in other studies.

3.4 Potential interventions for tobacco control with the social determinants approach

Under the WHO Framework Convention some of the potential interventions under the social determinants approach include [32]:

Structural interventions that address socioeconomic context and position in society:

- Reducing availability of tobacco and tobacco products through Price and tax measures to reduce the demand for tobacco and Prohibition

of sales to minors (Article 6 of FCTC).

- Increasing the acceptability of tobacco control as a global public good: health as an essential component of development and the concept of "health over profit" as a core value of development programmes.
- Enhancing accessibility to tobacco control, for example, through channelling tobacco tax revenues into tobacco control programmes

Structural interventions addressing differential exposure to tobacco among different socioeconomic groups:

- Increasing the availability of environments supportive of tobacco control: Establishing tobacco-free environments, for example by banning smoking in workplaces and public places (Article 8 of FCTC)
- Reducing the social acceptability of tobacco use: Banning tobacco advertising, promotion and sponsorship (Article 13), Packaging and labeling of tobacco products and effective health warnings, promoting tobacco-free role models

Demand reduction policies such as higher taxes and comprehensive bans on tobacco marketing and smoking in public places are among the principal cost-effective means to reduce tobacco use and its consequent harms to health and economic development.[33] In the book Tobacco control in developing countries published on behalf of the World Bank and WHO,[34] the cost-effectiveness of three interventions to reduce smoking was estimated: price increases through taxes; a package of other non-price measures, including comprehensive tobacco advertising and promotion bans, bans on smoking in public places, health warning labels on cigarette packs; public information programmes and nicotine replacement therapy (NRT). They found that the most cost-effective initiative, measured in terms of cost per life saved, was to raise prices through a tax increase.

4. Way forward

Raising awareness of the tobacco-poverty links could help both to incorporate tobacco control into global and national development agendas and to make non-health players aware of the importance of an examination of tobacco control as a poverty alleviation measure. Tobacco and poverty research is an important mechanism to support advocacy campaigns for stronger tobacco control laws and policies. Research results, especially when presented in a way that generates media attention, can do much to gain the attention of policymakers, and thus motivate them towards positive tobacco control action that can also play a significant role in reducing poverty. In spite of the increased global attention being given to tobacco control, the relationship between tobacco and poverty is not yet being addressed in national poverty alleviation schemes. National poverty eradication programmes must include national initiatives designed to generate safer alternative livelihoods for tobacco workers [35]. Governments contemplating action to control tobacco have to overcome political barriers while simultaneously adopt proven cost effective strategies through a social determinants approach. At global level, there is a need to integrate tobacco control into MDG activities and into national development planning along with international development partners, civil society, the UN system.[23]

Summary

Tobacco is a major shared risk factor for several non communicable diseases. and its control is one of the priority interventions to face the global NCD crisis. Full implementation of the FCTC interventions has been touted to be one of the best buys for NCD prevention and control. However, tobacco is both a health and developmental issue. Tobacco and poverty are interlinked in a vicious cycle and is linked to development through several pathways as evidenced by the research both at national and international level. Evidence for the link between development and tobacco control both in India and elsewhere has provided the much needed impetus for tobacco control to be included as a part of development planning and poverty reduction under a health systems and social determinants approach. In conclusion, regular surveillance of tobacco use and the implementation of control interventions under the equity framework is essential to achieve the Millenium developmental Goals.

Unit Review Questions

1. Briefly describe the relationship between poverty and tobacco with diagrammatic representation. List the reasons of increased susceptibility to tobacco among the poor.
2. What are social determinants of health? Give a list of tobacco control interventions under the social determinants approach.

3. How is tobacco linked to the Millenium Development Goals? Provide rationale for inclusion of tobacco control in development agenda.

Application question (s)/ Assignment

1. Review the literature that links tobacco to poverty and development. In a tabular form, list the articles with conclusions both in developed and developing countries including India.
2. Review in detail the national development plan and poverty alleviation strategies in a developed country with respect to tobacco control.

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CHAPTER 5

NCD AND TOBACCO: THE RISK FACTOR APPROACH

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Understand the burden of NCDs and its risk factors.
2. Levels of prevention and approaches to prevention.
3. Risk factor approach for prevention of NCDs
4. Best-buys for prevention and control of NCDs

KEYWORDS

NCDs, risk-factor approach, tobacco control

1. Introduction

The global burden and threat of non-communicable diseases (NCDs) constitutes a major public health challenge. The burden of NCDs undermines social and economic development throughout the world, and contributes to the increasing inequalities between countries and within populations.

38 million deaths of the total of 56 million deaths occurred worldwide during 2012 were due to NCDs, principally cardiovascular diseases, cancer and chronic respiratory diseases. Nearly three quarters of these NCD deaths (28 million) occurred in low and middle-income countries. The leading causes of NCD deaths in 2012 were: cardiovascular diseases (17.5 million deaths, or 46.2% of NCD deaths), cancers (8.2 million, or 21.7% of NCD deaths), respiratory diseases, including asthma and chronic obstructive pulmonary disease (4.0 million, or 10.7% of NCD deaths) and diabetes (1.5 million, or 4% of NCD deaths). Four major NCDs were responsible for 82% of all deaths due to NCDs.(1)

Age-standardized death rates reflect the risk of dying from NCDs, regardless of the total population size or whether the average age in the population is high or low. In 2012, the age-standardized NCD death rate was 539 per 100 000 population globally. The rate was lowest in high-income countries (397 per 100 000) and highest in low-income countries (625 per 100 000) and lower-middle-income countries (673 per 100 000). Premature death is a major consideration when evaluating the impact of NCDs on a given population, with approximately 42% of all NCD deaths occurring before the age of 70 years in 2012. The majority of premature deaths (82%) are in low and middle-income countries. In low-and middle-income countries, a higher proportion (48%) of all NCD deaths are estimated to occur in people under the age of 70 years, compared with high-income countries (28%).

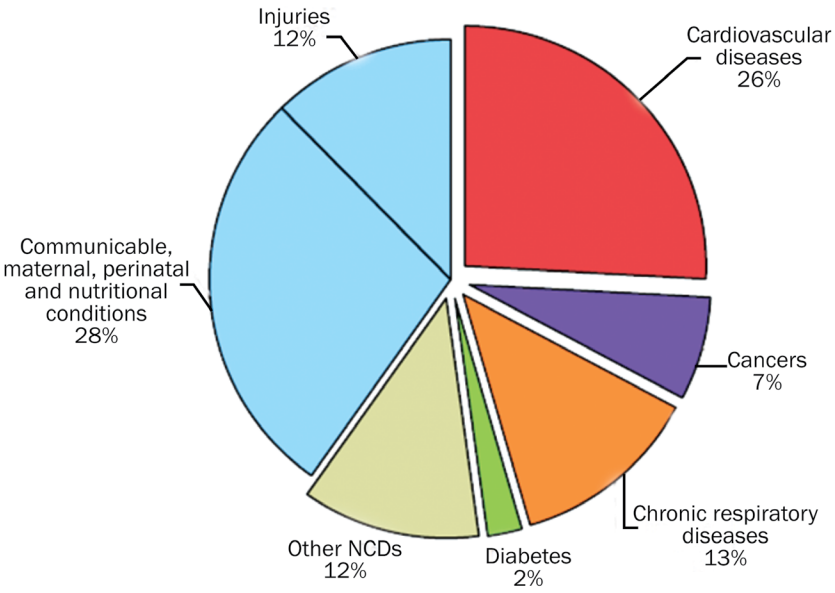

Figure 1: Proportional mortality (% of total deaths, all ages, both sexes)

NCDs are responsible for 60% total deaths in India. Cardiovascular diseases, cancers and chronic respiratory diseases and diabetes are major contributors to the total deaths from NCDs.[2] Cardiovascular diseases, cancers, chronic respiratory diseases and diabetes contribute to 80% of death burden.

In addition NCDs constitute major contribution to global burden of diseases.

In summary NCDs affects all countries, their impact is severe in low and middle income countries and the majority of NCDs deaths occur in productive life years possesses an economic and developmental challenge.

2. Prevention and Control of NCDs

Chronic diseases can be prevented and controlled using available knowledge. Two broad approaches, population based approach and individual approaches are advocated for prevention and control of NCDs.

Population-wide approaches seek to reduce the risks throughout the entire population. They address the causes rather than the consequences of chronic diseases and are central to attempts to prevent the emergence of future epidemics. Small reductions in the exposure of the population to risk factors such as tobacco use, unhealthy diet and physical inactivity lead to population-level reductions in cholesterol, blood pressure, blood glucose and body weight. More fundamentally, interventions are also required to address the underlying determinants of chronic disease.

On the other hand, interventions for individuals focus on people who are at high risk and those with established chronic disease. These interventions reduce the risk of developing chronic disease, reduce complications, and improve quality of life.

Population-wide and individual approaches are complementary to each other. They should be combined as part of a comprehensive strategy that serves the needs of the entire population and has an impact at the individual, community and national levels. Comprehensive approaches should also be integrated: covering all the major risk factors and cutting across specific diseases.[3]

3. Risk Factors

The concept of risk factors are more pertinent to the pathogenesis of NCDs. Risk factors are those whose presence potentiates the emergence of NCDs. Broadly risk factors are categorised into two groups namely; modifiable and non-modifiable. Non-modifiable risk factors are age, gender, ethnicity and

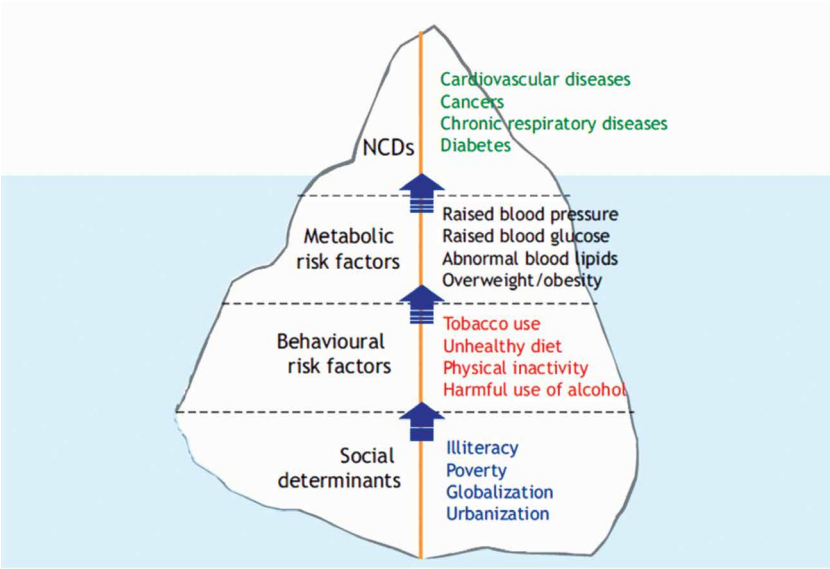

Figure 2: Risk factors of NCDs

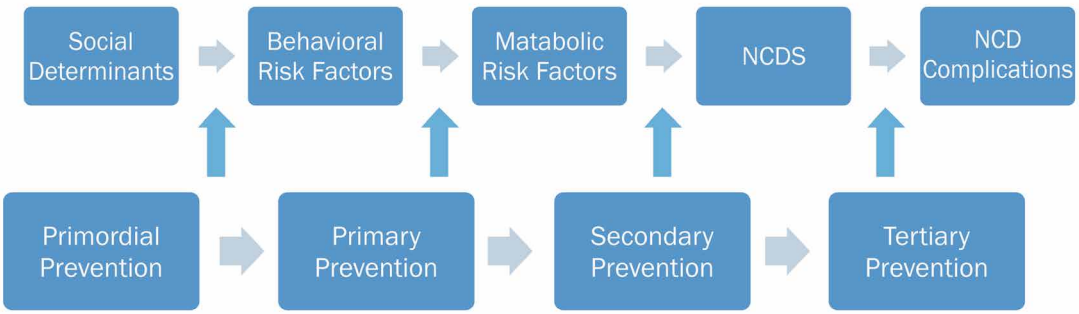

Figure 3: Levels of prevention and parthenogenesis of NCDs

family history of NCDs. Little can be done for the non-modifiable risk factors except a rigorous/structured screening programme to identify the disease early and managing them. However, modifiable risk factors can be addressed using population based and individual based approaches. Most common modifiable risk factors are tobacco use, physical inactivity, unhealthy diet, and the harmful use of alcohol. The modifiable risk factors are also called as behavioural risk factors as the interventions are behavioural in nature. The behavioural risk factors results in a set of risk factors called as biological/physiological risk factors such as raised blood pressure, overweight/obesity, raised blood glucose and raised cholesterol.

Prevention and Control of NCDs

Prevention and control of NCDs are approached in different levels of prevention such as primordial, primary, secondary and tertiary prevention based on the stage of development of disease. Primary prevention acts at pre-pathogenesis stage and uses health promotion and specific protection strategies. Secondary prevention acts at early pathogenesis and used early diagnosis and management strategies. Tertiary prevention acts at late pathogenesis and post-pathogenesis stage and used disability limitation and rehabilitation strategies. The most important primordial prevention acts before primary prevention and prevents emergence of risk factor development.

In the context of NCDs primary prevention acts at modifiable behavioural risk factors (tobacco use, physical inactivity, unhealthy diet, and the harmful use of alcohol), secondary prevention acts at biological/physiological risk factors (raised blood pressure, overweight/obesity, raised blood glucose and raised cholesterol) and tertiary preventions acts management of chronic disease and its complication. Primordial prevention acts on the emergence of behavioural risk factors. Thus primordial prevention is truly public health approach in practice.

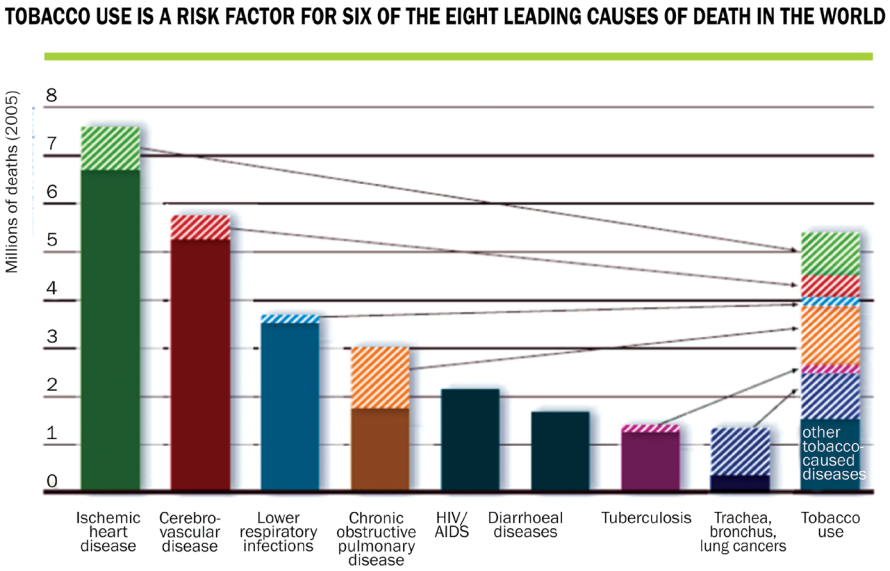

Figure 4: Tobacco use as a risk factor for leadinga causes of death.

4. Tobacco attributable deaths

Globally 12% of all deaths among adults aged 30 years and over were attributed to tobacco. In 2004, about 5 million adults aged 30 years and over died from direct tobacco use (smoking and smokeless) around the globe, that is one death approximately every six seconds. The proportion of mortality attributable to tobacco is higher among men than among women. Globally, 5% of all deaths from communicable diseases, and 14% of all deaths non-communicable diseases among adults aged 30 years and over are attributable to tobacco. Globally, death among people who died from tobacco-related diseases of the cardiovascular system was more likely to occur among younger adults. Of those adults aged 30-44 years who died from ischemic heart disease, 38% of the deaths were attributable to tobacco. 71% of all lung cancer deaths are attributable to tobacco use. 42% of all chronic obstructive pulmonary disease are attributable to tobacco use.[4]

Box 1: Best Buys for Non-communicable Diseases
Tobacco • Reduce affordability of tobacco products by increasing tobacco excise taxes • Create by law completely smoke-free environments in all indoor workplaces, public places and public transport • Warn people of the dangers of tobacco and tobacco smoke through effective health warnings and mass media campaigns • Ban all forms of tobacco advertising, promotion and sponsorship
Harmful use of alcohol • Regulate commercial and public availability of alcohol • Restrict or ban alcohol advertising and promotions • Use pricing policies such as excise tax increases on alcoholic beverages
Diet and physical activity • Reduce salt intake • Replace transfats with unsaturated fats • Implement public awareness programmes on diet and physical activity • Promote and protect breastfeeding

5. Best-buys for preventions of NCDS

Best-buys are set of cost-effective, high-impact and feasible interventions even in resource limited settings. Reducing tobacco use is one of the best buys for preventing NCDs along with reducing harmful use of alcohol, promotion of healthy diet and physical activity. Tobacco control interventions have high impact on burden of non-communicable diseases, high feasibility and should be directed towards whole population and will be benefit for the poor, and reduce inequities.

The best-buys for NCDS focusing on the four major risk factors are given in box 1: [5]

Among the above mention best buys most feasible seems to be tobacco, as a strong treaty is in place FCTC which is legally binding for the member countries to act upon.

Summary

The global burden NCDs are on the rise. Prevention and control of NCDs are possible with the existing knowledge and evidence. Both population based and individual based approaches should be used for prevention and control of NCDs. Primordial and primary prevention strategies focusing risk factors shall result in high dividends. The best-buys advocated by World Health Organization should be implemented within the existing health system to halt the progress of NCDs.

Unit Review Questions

1. Enumerate the common Non-Communicable Diseases and the risk factors.
2. Describe the levels of prevention in the context of NCD prevention & control
3. What are the best buys in NCD prevention & control?

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CHAPTER 6

TOBACCO CONTROL POLICIES AND LEGISLATIONS: FCTC MPOWER AND COTPA

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. List global tobacco control policies and legal instrument available for Tobacco control
2. Understand components of WHO MPOWER strategy and their status of implementation in India
3. Define legislative provisions of tobacco control in Indian legislation named COTPA and challenges to its implementation

KEYWORDS

COTPA, FCTC, MPOWER, WHO, Strategy,

1. Introduction

With huge global and national burdens of tobacco there has to be comprehensive tobacco control policies and programs which aim to reduce disease, disability, and death related to tobacco use. A comprehensive approach—one that includes educational, clinical, regulatory, economic, and social strategies—has been established as the best way to eliminate the negative health and economic effects of tobacco use. In this chapter, we intend to discuss following three major tobacco control frameworks and legislations which exist for an effective tobacco control globally and in India:

(I) WHO Framework Convention on Tobacco Control (WHO FCTC)

(II) WHO MPOWER Strategy

(III) Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003 (COTPA 2003)

2. WHO Framework Convention on Tobacco Control (WHO FCTC)[1]

The WHO Framework Convention on Tobacco Control (WHO FCTC) is the first treaty negotiated under the auspices of the World Health Organization. It is evidence-based treaty that reaffirms the right of all people to the highest standard of health. The WHO FCTC represents a paradigm shift in developing a regulatory strategy to address tobacco menace. In contrast to previous drug control treaties, the WHO FCTC asserts the importance of demand reduction strategies as well as supply issues.

2.1 How treaty came into being?

The treaty was developed in response to the globalization of the tobacco epidemic. The spread of the tobacco epidemic is facilitated through a variety of complex factors with cross-border effects, including trade liberalization and direct foreign investment. Other factors such as global marketing, transnational tobacco advertising, promotion and sponsorship, and the international movement of contraband and counterfeit cigarettes have also contributed to the explosive increase in tobacco use. The treaty ideas originated in 1993 and gained wide acceptance in 1996 when the World Health Assembly voted to proceed with its development. Negotiations by WHO member states led the World Health Assembly in May 2003 to adopt by consensus the WHO Framework Convention on Tobacco Control—the first international treaty adopted under WHO auspices. The treaty opened for signature on 16 June to 22 June 2003 in Geneva, and thereafter at the United Nations Headquarters in New York, the Depositary of the treaty, from 30 June 2003 to 29 June 2004. The Convention entered into force on 27 February 2005 - 90 days after it had been acceded to ratified accepted or approved by 40 States.[2]

There are currently 180 parties to the treaty, including the European Community, which makes it one of the most widely embraced treaties in UN history. The Conference of the Parties (COP) is the governing body of the WHO FCTC and is comprised of all Parties to the Convention Member States that have signed the Convention. Members indicate that they will strive in good faith to ratify, accept or approve it, and show political commitment not to undermine the objectives set out in it.

2.2 Provisions of Treaty

There are two broad provisions suggested in the FCTC viz. Demand reduction and supply reduction measures contained in many Articles to the convention. The Parties have made varying progress on these measures since 2005, often as a result of fulfilling their obligations under the convention. The global progress reports and the implementation database maintained by the Convention Secretariat demonstrate the achievements as well as the areas in which more progress needs to be made.[3]

The detailed Convention can be better understood as below:

A) Articles 3 to 5: Meant to establish the objectives, guiding principles and general obligations engendered by the treaty

B) Articles 6 to 14: Demand-side reduction measures;

- **Article 6:** Price and Tax measure: It encourages price and tax measures as effective means to reduce the demand for tobacco. These include tax increases that result in an increase of the sales price of tobacco products; and prohibiting or restricting sales of tax- and duty-free tobacco products.
- **Article 7:** Non-price measures to reduce the demand for tobacco, stipulates that Parties shall implement non-price measures pursuant to Articles 8 to 13 through effective legislation, regulation and policies.
- **Article 8:** Protection from exposure to tobacco smoke addresses the adoption and implementation of effective measures to provide protection from exposure to tobacco smoke in indoor workplaces, public transport, indoor public places and as appropriate other public places. The guidelines recommend that comprehensive smoke-free policies be put in place within five years of entry into force of the Convention for that Party.
- **Article 9:** Regulating content of tobacco products: it requires parties to regulate the contents and emission of tobacco products and the methods by which they are tested and measured.
- **Article 10:** Regulation of tobacco product disclosures: It calls upon Parties to request manufacturers and importers to disclose to government authorities and the public information on the constituents and emissions of tobacco products.
- **Article 11:** Packaging and labelling of tobacco products: It requires each party within three years of entry into force of the Convention for that Party to adopt and implement effective measures to prohibit misleading tobacco packaging and labelling; ensure that tobacco product packages carry large health warnings and messages describing the harmful effects of tobacco use; ensure that such warnings cover 50% or more, but not less than 30%, of principal display areas and that they are in the party principal language(s); and ensure that packages contain prescribed information on the tobacco products constituents and emissions.
- **Article 12:** Education, communication, training and public awareness: Education, communication, training and public awareness, concerns raising

public awareness of tobacco control issues through all available communication tools, such as media campaigns, educational programmes and training.

- **Article 13:** Ban on Tobacco advertising, promotion and sponsorships (TAPS): It requires Parties to undertake a comprehensive ban of all tobacco advertising, promotion and sponsorship and the ban should cover all types of tobacco advertising and promotion as well as any sponsorship conducted by the tobacco industry.
- **Article 14:** Demand reduction measures concerning tobacco dependence and cessation: It concerns the provision of support for reducing tobacco dependence and cessation, including counselling, psychological support, nicotine replacement, and education programmes. Parties are required to develop and disseminate national guidelines on tobacco cessation and are encouraged to establish sustainable infrastructure for such services.

C) Articles 15-17: Supply-side reduction measures:

- **Article 15:** Eliminate illicit trade: It concerns the commitment of Parties to eliminate all forms of illicit trade in tobacco products. The Protocol to Eliminate Illicit Trade in Tobacco Products builds on this article.
- **Article 16:** Protection of youth: It describes the measures that Parties are required to take to prohibit the sales of tobacco products to or by persons under the age set by domestic law, national law or 18 years, as well as other measures limiting the access of underage persons to tobacco products.
- **Article 17:** Provision of support for economically viable alternative activities: The Parties are obligated, in cooperation with each other and with competent intergovernmental organizations, to promote economically viable alternatives for tobacco workers, growers and, as the case may be, individual sellers.

D) Other provisions under FCTC to name are:

- Article 18: Protection of the environment
- Article 19: Liability
- Articles 20-22: Cooperation and communication;
- Articles 23-26: Institutional arrangements and financial resources;
- Article 27: Settlement of disputes;
- Articles 28-29: Development of the convention
- Articles 30-38: "Final provisions", covering statutory matters such as means of acceding to the Convention, entry into force, and so on.

Training package developed by The Union and WHO-TFI to help parties to the FCTC to fulfil their obligations: www.tobaccofreeunion.org/content/en/411

Global Progress of FCTC: Implementation of the Convention has progressed steadily since entry into force in 2005, with the average implementation rate of its substantive articles approaching 60%, compared with just over 50% in 2010. Progress is, however, uneven between different articles, with implementation rates varying from less than 20% to more than 75%. Implementation is also uneven between Parties and regions.

Figure 1: Training package developed by The Union and WHO

Figure 2: FCTC documents

Source: http://www.who.int/fctc/publications/en/

Global Progress of FCTC

- After 10 years a positive trend in global progress is visible.
- Signed by 187 countries, Zimbabwe is the last country.
- Ratified by **180** countries.
- USA still not ratified.
- **120+** parties have adopted or strengthened their tobacco control legislation after ratifying the FCTC.
- High implementation of protection from exposure to tobacco smoke (Article 8), packaging and labelling (Article 11).
- Low implementation of bans on tobacco advertising, promotion and sponsorship (Article 13),.
- Significant improvements in implementation of price and tax measures (Article 6), protection from exposure to tobacco smoke (Article 8), and demand reduction measures concerning tobacco dependence and cessation.

India and FCTC:

- India established National Tobacco Control Cell (NTCC) in February 2001 to provide impetus to tobacco control efforts in India.
- Tobacco Control legislation, COTPA was enacted in May 2003, even before FCTC came into force
- India ratified FCTC in February 2004
- India designed and launched a comprehensive National Tobacco Control Programme with dedicated budget in 2006-07
- National Level Mass Media campaigns to educate people have been launched since 2008
- High level inter-ministerial committee constituted to ensure coordinated approach for tobacco control
- Actions initiated for alternative crops and livelihood

Recent years have witnessed several strong achievements, innovative approaches and positive trends, which demonstrate the strong commitment of Parties to achieve full implementation of the Convention. Strengthening national capacity and legislation for tobacco control, general obligations under the Convention, have an overarching impact on its full implementation. Overall, 80% of the Parties have strengthened their existing or adopted new tobacco control legislation after ratifying the Convention, but one third of the Parties have still not put in place legislative measures in line with the requirements of the Convention. In terms of national capacity, it is still the case that not all Parties have designated a national tobacco control focal point, and even fewer Parties have increased full-time capacity in tobacco control.

3. WHO MPOWER Strategy

WHO FCTC and its guidelines provide the foundation for countries to implement and manage tobacco control. To help make this a reality, WHO introduced the MPOWER measures. These measures are intended to assist in the country-level implementation of effective interventions to reduce the demand for tobacco, contained in the WHO FCTC[4].

The MPOWER acronym is a set of six proven recommendations to reverse the global tobacco epidemic.

Box 1: MPOWER strategy

Policies and interventions of the mpower package

m **MONITOR TOBACCO USE** Cross-cutting acitivity **m1** Obtain nationally-representative and population-based periodic data on key indicators of tobacco use for youth and adults		
	p	**PROTECT PEOPLE FROM TOBACCO SMOKE**
	Intervention **P1**	Enact and enforce completely smoke-free environments in health-care and educational facilities and in all indoor public places including workplaces, restaurants and bars
	o	**OFFER HELP TO QUIT TOBACCO USE**
	Intervention **01**	Strengthen health systems so they can make tobacco cessation advice available as part of primary health care. Support quit lines and other community initiatives in conjunction with easily accessible, low cost pharmacological treatment where appropriate
	w	**WARN ABOUT THE DANGERS OF TOBACCO**
	Intervention **W1**	Require effective package warning labels Implement counter-tobacco advertising
	Intervention **W2**	
	Intervention **W3**	Obtain free media coverage of anti-tobacco activities
	e	**ENFORCE BANS ON TOBACCO ADVERTISING, PROMOTION AND SPONSORSHIP**
	Intervention **E1**	Enact and enforce effective legistation that comprehensively bans any form of direct tobacco advertising, promotion and sponsorship
	Intervention **E2**	Enact and enforce effective legistation to ban indirect tobacco advertising, promotion and sponsorship
	r	**RAISE TAXES ON TOBACCO PRODUCTS**
	Intervention **r1**	Increase tax rates for tobacco products and ensure that they are adjusted periodically to keep pace with inflation and rise faster than consumer purchasing power
	Intervention **r2**	Strengthen tax administration to reduce the illicit trade in tobacco products.

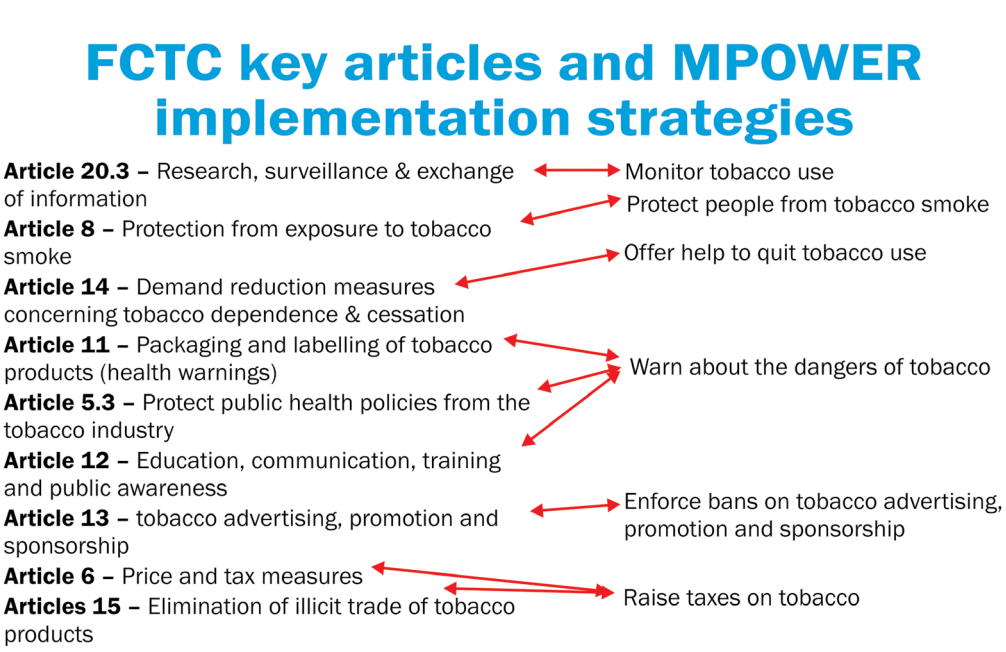

Figure 3: FCTC Key Articles

3.1 Global Progress of MPOWER

This WHO Report on the Global Tobacco Epidemic, 2013 shows that any country can establish an effective tobacco control programme to reduce tobacco use, regardless of its political structure or income level[5].

- In total, more than 2.3 billion people –a third of the world's population – are now protected by at least one of the MPOWER measures at the highest level of achievement. Nearly 1 billion people are protected by two or more measures at the highest level.
- Nearly 1.3 billion people are newly protected by at least one measure applied nationally in the past five years, since WHO released the first report.
- Creation of smoke-free public places and workplaces continues to be the most commonly established measure at the highest level of achievement. There are 32 countries that passed complete smoking bans covering all work places, public places and public transportation means between 2007 and 2012, protecting nearly 900 million additional people. Since 2010, 12 countries and one territory, with 350 million people, passed strong smoke-free laws at a national level.
- More than half a billion people in nine countries have gained access to appropriate cessation services in the past five years. However, there has been little progress since 2010, as only four additional countries with a combined population of 85 million were newly provided access to cost-covered services including a toll-free national quit line.
- Effective health warning labels on tobacco packaging continue to be established by more countries. In the past five years, a total of 20 countries with 657 million people put strong warning label requirements in place, with 11 countries (with 265 million people) doing so since 2010.
- National mass media campaigns, first assessed in 2010, have been conducted in the past two years by about one fifth of countries, which have more than half the world's population.
- Complete bans on all tobacco advertising, promotion and sponsorship have been put in place to protect more than half a billion people in 16 countries in the past five years. Since 2010, six countries with nearly 400 million people newly established this measure at the highest level.
- Raising taxes to increase the price of tobacco products remains the measure least likely to be established. Only 14 countries and one territory with 166 million people have increased their tax rates to sufficiently high levels in the past five years, and only six countries with 29 million people have done so in the past two years.
- Adequately staffed national tobacco control government structures have been established by six countries with 413 million people in the past five years. In the past two years, three countries with 150 million people newly established a structure to manage national tobacco control programmes

3.2 MPOWER and India

India has taken many steps to effectively implement WHO MPOWER, the technical assistance package of six evidence-based policies.

Monitor: The Global Adult Tobacco Survey (GATS) is the global standard for systematically monitoring adult tobacco use (smoking and smokeless) and tracking key tobacco control indicators.

GATS India is a nationally representative survey, using a consistent and standard protocol which has enhanced India's capacity to design, implement and evaluate tobacco control programs. It will also assist India to fulfill their obligations under the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) to generate comparable data within and across countries. Additionally, India has been conducting and supporting regularly Global Youth Tobacco Survey (GYTS 2003, 2006, 2009) [6], Global School Personal Survey (GSPS 2006, 2009) and Global Health Professions Student Survey (GHPSS 2005-09).

Protect: Section 4 of COTPA ensures all public, workplaces and many open places are smokefree. However, the legislation exempts hotel having thirty or more rooms or restaurant having seating capacity of thirty persons or more and the airports which may provide for a smoking area or space.

Offer: To support tobacco users quit tobacco is an important component of India's National Tobacco Control Programme (NTCP). A district level tobacco cessation centre (TCC) is being established in each district hospital and shall be provided with staff, equipments, training and outreach activities.

Warn: Section 6,7,8 and 9 of COTPA provides that youth are protected and everyone is warned about harms of tobacco use through specified health warning labels on all tobacco products. Additionally, National level Mass Media Campaigns have been launched since 2008 to educate public about harms of tobacco and highlight enforcement of policy provisions of COTPA.

Enforce: Section 5 of COTPA discourages the use or consumption of tobacco products by eliminating all forms of direct & indirect advertisement promotion & sponsorship of tobacco products.

Raise: The tax base of tobacco in India is heavily dependent on about 14% of cigarette smokers; Non-cigarette tobacco products accounting for 85% of the tobacco consumption contributes only 15% of the total tobacco taxes. Specific excise is imposed on cigarettes (per 1000 sticks) based on the length of the cigarette and the tax rates are higher for filter than non filter. There are very low taxes on Bidi and smokeless tobacco. Thus currently, tobacco taxes on cigarettes in India are very low i.e. 38% in contrast to World Bank recommendations of 65 to 85% of retail price of cigarettes. Further, Tobacco taxes in India are not regularly adjusted for inflation, and over time tobacco products are becoming increasingly affordable.[7]

In conclusion, we can say that India has made moderate progress on MPOWER but lot more need to be done especially removing exemptions in Section 4 (Smokefree policies); Pack warnings as per FCTC recommendations, rapidly scale-up tobacco cessation services and rationalise tobacco taxation to make people quit tobacco.

4. Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003 (COTPA 2003)

The Act is applicable to all products containing tobacco in any form i.e. cigarette, cigars, cheroots, bidis, hukka, gutka, pan masala (containing tobacco) khaini, mawa, mishri, snuff etc. as detailed in "The Schedule" to the Act. It extends to the whole of India.

4.1 Major provisions under COTPA:

- Section 4 – Prohibition of smoking in a public places- Smokefree.
- Section 5 – Prohibition of advertisements of tobacco and other tobacco products (Tobacco Advertisement, Promotions and Sponsorship).
- Section 6 (a) - Prohibition of sale of tobacco products to and by minors.
- Section 6 (b) - Prohibition on sale of tobacco products within the radius of 100 yards of any educational institutions.
- Section 7, 8 & 9 – Mandatory display of specified health warning labels on all tobacco products.
- Section 11 - Testing the nicotine and tar contents in cigarettes and any other tobacco products.
- Section 12 - Power of entry and search.
- Section 13 - Power to Seize.
- Section 20 to 24 - Punishments for violations under various Sections of COTPA.
- Section 29 - Protection of action taken in good faith.

Section 4,5,6 and 7 are principal policy provisions as per guidelines of FCTC and MPOWER and are being explained here in this chapter:

SECTION 4: Prohibition of smoking in a public places and Prohibition of Smoking in Public Places Rules, May 2008; effective from 2nd October,2008:

S. 3(I): "Public Place": Means any place to which the public have access, whether as of right or not, and includes auditorium, hospital buildings, railway waiting room, amusement centres, restaurants, public offices, court buildings, educational institutions, libraries, public conveyances and the like which are visited by general public but does not include any open space.

The owner, proprietor, manager, supervisor or in charge of the affairs of a public place **shall ensure** that:

(a) No person smokes in the public places under his jurisdiction

(b) The board as specified in schedule II is displayed prominently at the entrance of the public place, in case there are more than one entrance at each

such entrance and conspicuous place(s) inside. In case if there are more than one floor, at each floor including the staircase and entrance to the lift/s at each floor.

c) No ashtrays, matches, lighters or other things designed to facilitate smoking are provided in the public place

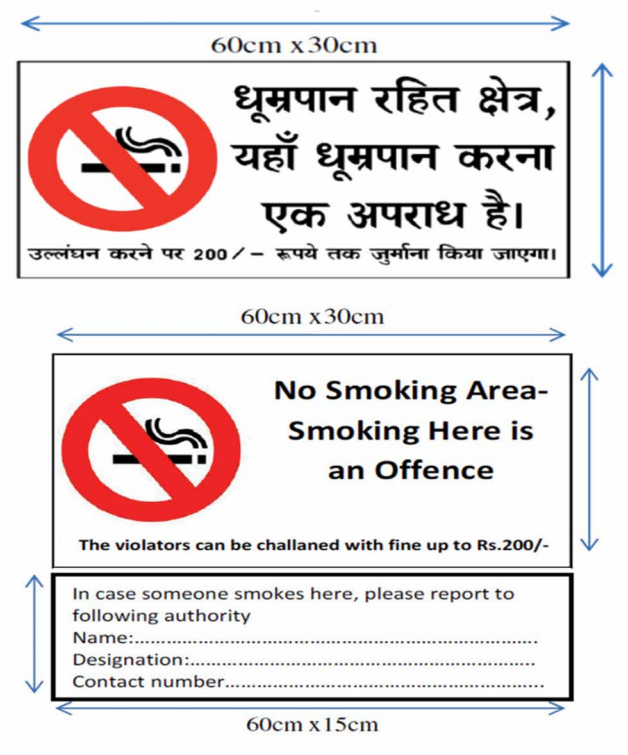

Figure 4: No Smoking Signages as prescribed under COTPA

Additionally the rules also specify that:

- The owner, proprietor, manager, supervisor or in-charge of the affairs of a public place shall notify and cause to be displayed prominently the name of the person(s) to whom a complaint may be made by a person(s) who observes any person violating the provision of these Rules.
- Smoking Area or space: (1) The owner, proprietor, manager, supervisor or in charge of the affairs of hotel having thirty or more rooms or restaurant having seating capacity of thirty persons or more and the manager of the airport may provide for a smoking area or space as defined in rule 2 (e).

  (2) Smoking area or space shall not be established at the entrance or exit of the hotel, restaurant and the airport and shall be distinctively marked as "Smoking Area" in English and one Indian language, as applicable.

  (3) A Smoking area or space shall be used only for the purpose of smoking and no other services shall be allowed.

List of authorized officers to enforce Section 4 provisions of the legislation: Twenty one categories of government officials of various departments have been authorized to act against violations of Section 4. They include officials from health, police, FDA, education, transports, and panchayti raj institutions.

SECTION 5: Prohibition of advertisements of tobacco and other tobacco products: The overall objective of this section is to discourage the use and advertisements consumption of tobacco products by eliminating all forms of direct& indirect advertising, promotion and sponsorship of tobacco products.

Provisions under Section 5:

- No person engaged in the production, supply or distribution of tobacco products shall advertise.
- No person having control over a medium shall cause to be advertised through that medium.
- No person shall take part in any advertisement which directly or indirectly suggests or promotes to use or consumption of tobacco products.
- No trade mark or brand name of cigarettes or any tobacco product to be promoted in exchange for sponsorship, gift, prize or scholarship.
- No person, under contract or otherwise, promote or agree to promote any tobacco product or its usage.

Restriction on tobacco usage in Films & Television Programmes Rules, 27 October, 2011:

- A strong editorial justification explaining the necessity of such display
- A 'U/A' Certification
- Anti-Tobacco Health Messages or Spots of 30 seconds duration (beginning and middle)
- Anti-Tobacco Health Warning scroll during period of such display
- A disclaimer by the concerned actor of minimum twenty seconds duration (beginning and middle)
- Prohibition on display of brands, logo of cigarettes or other tobacco products or any form of tobacco product placement and display of tobacco products or their use in the promos and poster of films and television programmes
- Prohibition on display of tobacco products in a manner that enables easy access of tobacco products to persons below the age of eighteen

years. Notification GSR 619(E), dated 11th, August, 2011

SECTION 6: This section has two provisions:

- **Section 6a: Prohibition on sale of tobacco products to and by persons below the age of eighteen years**[8]

(1) The owner or the manager or the in-charge of the affairs of a place where cigarettes or other tobacco products are sold shall ensure that-

(a) a board with a warning as specified in "Annexure I" is displayed at the entrance of the place where cigarettes or other tobacco products are sold and provided that such board shall not have any advertisement or promotional messages or pictures or images of cigarettes or any other tobacco products.

(b) no tobacco product is sold through a vending machine;

(c) no tobacco product is handled or sold by a person below the age of eighteen years;

(d) tobacco products are not displayed in a manner that enables easy access of tobacco products to persons below the age of eighteen years.

(2) The onus of proof, that the buyer of the tobacco product is not a person below the age of eighteen years lies with the seller of the tobacco products and the seller in case of doubts may request the buyer to provide appropriate evidence or age proof of having reached eighteen years of age.

ANNEXURE I board:

1. The Board shall be of a minimum size of 60 cm by 30cm of white back ground.
2. The Board shall contain the warning "sale of tobacco products to a person below the age of eighteen years is a punishable offence", in Indian language (s) as applicable and a pictorial depiction of the ill effects of tobacco use on health.

- **Section 6b:** Prohibition of sale in an area within a radius of one hundred yards of any educational institution. The owner or manager or any person in-charge of affairs of the educational institution shall display and exhibit a board at a conspicuous place(s) outside the premises, prominently stating that sale of cigarettes and other tobacco products in an area within a radius of one hundred yards of the educational institution is strictly prohibited and that it is an offence punishable under Section 24 of the Act with fine which may extend to two hundred rupees.

Sale of cigarettes and other tobacco products in an area within a radius of one hundred yards of educational institution is strictly prohibited and that it is an offence punishable under Section 24 of the Act with fine which may extend to two hundred rupees

By order:

Section 6 b Signage to be displayed outside the premises of an educational institute

Measurement of Distance: The distance of one hundred yards shall be measured radially starting from the outer limit of boundary wall, fence or as the case may be, of the educational institution.

ENFORCEMENT PROCEDURE FOR SECTION 4 & 6

a) On the spot fine: The person(s) authorized by the central or state government in this behalf, shall within his/her jurisdiction issue challans and recover on the spot fine (as the offence is compoundable. Refer to section 21 and 24 of the Act).

OR

Figure 5: Section 6a board to be displayed at Point of Sale

Penalty before a Court: Issue challans with the direction that the offender pays the fine at the designated court or treasury on any given/fixed day(s) as may be decided by the State Government (when he fails to pay fine but furnishes his name and address).

b) Detention of violator: In case a violator refuses to pay the fine and further fails to furnish his/her name and address, and otherwise fails to satisfy the authorized officer that he/she will duly answer any summons or other proceedings which may be taken against him/her, such person may be detained by the authorized officer (Refer to Section 25).

c) The authorized person shall then hand over the detained person to the concerned police station and lodge a complaint under section 21 or 24 of the Act 2003.

d) Any person detained shall forthwith be taken before the concerned Magistrate to be dealt with in accordance with law.

e) Place of trial: Any person committing an offence under section 4 & 6 shall be tried for such offence in any place in which he may be or which the State Government may notify in this behalf, as well as in any other place in which he/she is liable to be tried under any law for the time being in force.

f) An offence committed under section 4 & 6 may be compounded either before or after the institution of prosecution by the officers authorized by the Central Government or the State Government for an amount which may not exceed two hundred rupees (Refer to Section 28).

g) Where an offence has been compounded, the offender, if in custody, shall be discharged and no further proceedings shall be taken against him/her in respect of such offence.

h) Summary Trial of offence: All offences committed under section 4 & 6 of the Act shall be tried summarily in accordance with the procedure provided for summary trials in the Code of Criminal Procedure, 1973.

A complaint can be reported on the toll-free help line / online reporting system on the National Toll Free Helpline number 1800 110 456 or the concerned authorized officer as mentioned in the rules.

SECTION 7, 8 & 9 – Mandatory display of specified health warning labels on all tobacco products:

- Section 7: There shall be no production, sale and import of cigarettes or any other tobacco product unless every package of cigarettes or any other tobacco product bears on it label, specified warning.
- Section 8: Manner in which specified warning shall be made
- The specified warning on a package of cigarettes or any other tobacco products shall be-
  a) legible and prominent ;
  b) conspicuous as to size and colour
- Section 9: Language in which the specified warning shall be expressed

Punishments for violations of provisions of COTPA:

Section 20,21,22,23 and 24 of COTPA specifies punishments for violations of various provisions of the Act given below in Table 1. Further, Section 29 of the Act gives "Protection of action taken in good faith".It states that "No suit, prosecution or other legal proceeding shall lie against the Central Government or any State Government or any officer of the Central Government or any State Government for anything which is in good faith done or intended to be done under this Act"

Figure 6A: Specified package warnings for smoking forms of tobacco products

Figure 6B: Specified package warnings for chewing or smokeless forms of tobacco packages

Table 1: Punishment for violations of provisions of COTPA

Section of COTPA	Penalties for Violations: Fine/ Imprisonment/both
Section 4 – Prohibition of smoking in the public places	Up to Rs 200/-
Section 5 – Prohibition of advertisement	1st offence-2 years/Rs 1000/- 2nd offence-5 years/Rs 5000/-
Section 6 – Prohibition of sale to minor / around educational institutions	Up to Rs 200/-
Section 7,8,9 – Labeling and Packaging	Production sector 1st -2 years/Rs 5000/- 2nd- 5 years/Rs 10000/- Selling/ retailing 1st -1 years/Rs 1000/- 2nd- 2 years/Rs 3000/-

Enforcement of COTPA: The enforcement of various provisions of COTPA is variable across the country from negligible to good progress. Among all provisions of COTPA, smoke-free policies under Section 4 have got good public support[9] and better enforcement mechanism established in large number of cities, districts and states. Chandigarh became first city in India to declare itself Smokefree in July 2007 followed by Kottayam in Kerala 2009. Thereafter Shimla city, Sikkim state, Coimbatore, Villupuram, Bhubaneshwar in 2010[10]; Mizoram State, Ernakulum district, Delhi 2011; Mohali, Mansa (Pb), 12 district HQs (Himachal Pradesh), Badgam, Srinagar (J&K), Shjahanpur (Uttar Pradesh), Jhunjhunu (Rajasthan); Dhar and Burhanpur (Madhya Pradesh), Kanchipuram, Vellore, Chennai, Thiruvallur (Tamil Nadu) in 2012 and many more in 2013, 2014 and 2015 went smokefree based on a third party compliance assessment supported by International Union Against Tuberculosis and Lung Disease (The Union) under Bloomberg Initiative to Reduce Tobacco Use.[11] The compliance assessments were conducted using "Assessing Compliance with Smoke-Free Laws, A "How-to" Guide for Conducting Compliance Studies" developed jointly by Johns Hopkins Bloomberg School of Public Health, Campaign for Tobacco-free Kids and The Union[12]. Till now, more than 100 jurisdictions have achieved high level of compliance to smokefree laws and declared Smokefree by respective government authorities.

However, there is very little to moderate progress in enforcement of provisions of Section 5, 6 and 7 of COTPA across the state. Point of sale advertising is aggressively used by the tobacco industry to promote their products. There is an urgent need of effective implementation of a comprehensive ban on tobacco product advertisement, promotion and sponsorship at point of sale[13]. There are many challenges which include limited outreach of national programme; huge capacity building needs of law enforcers; sub-optimal stakeholder engagement; limited priority by states and limited capacity to enforce, monitor and evaluate.

Summary

The world health body and all national governments have the obligation towards protecting the health of the individuals and do so by framing and implementing policies, legislations and Acts. With respect to tobacco burden, at global level WHO FCTC has laid down norms through various articles to curb the menace of tobacco epidemic, which all the signatory of the WHO FCTC must follow and implement. The provisions under various articles of WHO FCTC in the form of MPOWER strategies aim at addressing the issues related with demand and supply of tobacco use. There is uneven progress of implementation of various provisions under WHO FCTC across regions and countries. The Government of India's commitment towards tobacco free India is evident from the enactment of The COTPA Act in 2003 and the fact that India became one of the first signatories to WHO FCTC. Among all provisions of COTPA, smoke-free policies under Section 4 have got good public support and better enforcement mechanism established in large number of cities, districts and states. The tobacco product advertisement, promotion and raising tobacco taxes uniformly on all tobacco products sponsorship (TAPS) activities by tobacco industry and remain the greatest challenge to protect against the ill effects of tobacco.

Unit Review Questions

1. What is FCTC and how it came into being?
2. Briefly describe global progress of FCTC.
3. What is WHO MPOWER strategy and status of its implementation in India?
4. Name national tobacco control legislation in India and what are its main provisions.
5. Briefly describe status of enforcement of COTPA and challenges to its enforcement.

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Suggested Readings

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CHAPTER 7

NATIONAL TOBACCO CONTROL PROGRAMME IN INDIA: A PERSPECTIVE

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Describe the burden of tobacco use in India
2. Understand the tobacco control policies and programmes at national and sub national level in India
3. Understand the components of National Tobacco Control Programme at different levels

KEYWORDS

India, law, prevalence, policy, tobacco, smokeless tobacco products

1. Introduction: Burden of Tobacco

Globally, tobacco consumption kills nearly 6 million people in a year. India is the second largest consumer of tobacco in the world. The tobacco epidemic in India is notable for the variety of smoked and smokeless products that are used and for their production by entities ranging from the loosely organized manufacture of bidi and smokeless products to multinational corporations manufacturing cigarettes for domestic consumption and export. An estimated one million Indians die annually from tobacco-related diseases.

The Global Adult Tobacco Survey India (GATS 2010) found that 35% of Indian adults in the age group, 15 years and above, use tobacco in one form or the other. The extent of use of smokeless tobacco products (SLT) is particularly alarming, nearly 33% among adult males and 18% among adult females. The mean age at initiation of daily tobacco use in India is 17.8 years[(1)]

2. Tobacco Control Law, Policy and Programme

Globally tobacco control policies and strategies remained confined mainly to control of cigarettes. Some specific challenges to regulation of the smokeless tobacco are relevant in Indian context. India enacted a comprehensive tobacco control legislation in order to protect the youth and masses from the adverse effects of tobacco usage and second hand smoke (SHS), namely the “Cigarettes and other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003 (COTPA-2003)”.

The prevalence of tobacco use among all the states and union territories ranges from the highest of 67 percent in Mizoram to the lowest of 9 percent in Goa. Prevalence of tobacco use in Arunachal Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Sikkim, Tripura, Assam and West Bengal is higher than the national average. In India, khaini or tobacco-lime mixture (12%) is the most commonly used smokeless tobacco product, followed by gutkha, a mixture of tobacco, lime and areca nut mixture (8%), betel quid with tobacco (6%) and applying tobacco as dentifrice (5%). Among smoking tobacco products, bidi (9%) is used most commonly, followed by the cigarette (6%) and the hookah (1%). As per the Global Youth Tobacco Survey (GYTS 2006), 14.6% of school students aged 13-15 years in India use some form of tobacco, 4.4% smoke cigarettes and 12.5% use other forms of tobacco.[1]

The specific provisions of the Act include, Prohibition of smoking in a public place (Section 4); Prohibition of direct and indirect advertisement, promotion and sponsorship of cigarette and other tobacco products (Section 5); Prohibition of sale of cigarette and other tobacco products to a person below the age of eighteen years [Section 6(a)]; Prohibition of sale of tobacco products near educational institutions [Section 6(b)]; and Mandatory depiction of statutory warnings (including pictorial warnings) on tobacco packs (Section 7,8 and 9). The Act covers all smoking and smokeless forms of tobacco and extends to the whole of India.[(2)]

The WHO Framework Convention on Tobacco Control (WHO FCTC) is the first global health treaty negotiated under the auspices of the World Health Organization. This convention is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. The FCTC was developed in response to the globalization of the tobacco epidemic which is facilitated through a variety of complex factors with cross-border effects like trade liberalization and global marketing, transnational tobacco advertising, promotion and sponsorship, and international movement of contraband and counterfeit cigarettes. India is a party to the Convention and is committed to implement all provisions of this international treaty. As already mentioned in the preceding paragraph, even before the World Health Assembly adopted the WHO FCTC on 21 May 2003, the comprehensive Tobacco Control Act (COTPA-2003), encompassing most of the FCTC provisions, was enacted by the Government of India (GoI) on 18th May 2003. This further mandates effective implementation of both the measures related to the reduction of demand for tobacco (Articles 6 to 14) and the measures related to the reduction of supply of tobacco (Articles 15 to 18), across all the states in the country.

3. National Tobacco Control Programme[(3)]

For effective implementation of provisions under COTPA and FCTC, the GoI initiated National Tobacco Control Programme (NTCP) in 2007. The NTCP strives to (i) create awareness about the harmful effects of tobacco consumption, (ii) reduce the production and supply of tobacco products, (iii) help tobacco users quit tobacco use, (iv) monitoring enforcement of COTPA and (v) facilitate implementation of tobacco control strategies advocated by WHO FCTC. Pilot phase of the NTCP was launched in the 11th Five Year Plan in the year 2007-08 in 9 states covering 18 districts. The programme was scaled-up to cover 12 new states and 24 new districts in the year 2008-09. Under the 12th Five Year Plan, changes were incorporated at the State and district level activities and budget of NTCP based on the feedback from the states and other stakeholders. It is envisaged to cover all the districts across the country under the NTCP in a phase-wise manner. The implementation of the programme at the district and sub-district level has been subsumed under the overarching umbrella of the National Health Mission (NHM) to bring in synergy at different levels of health care delivery.

The main thrust areas for the NTCP are as given under:

(i) Training of health and social workers, NGOs, school teachers, and enforcement officers;

(ii) Information, education, and communication (IEC) activities;

(iii) School programmes;

(iv) Monitoring of tobacco control laws;

(v) Setting-up and strengthening of cessation facilities

The NTCP would also try to tap all possible opportunities to integrate tobacco control interventions with other health programmes to ensure most effective and efficient use of available resources. Through the National Health Mission, the NTCP would specially strive to reach out to the urban poor, tribals and marginal populations in underserved areas, who are prone to the menace of tobacco products including smokeless forms of tobacco. Currently NTCP is under implementation in 108 districts covering 31 States/ UTs in the country. State Tobacco Control Cells are supported in 35 States/UTs.

3.1 Structure of NTCP

NTCP is implemented through a three-tier structure i.e. (i) National Tobacco Control Cell (NTCC) (ii) State Tobacco Control Cell (STCC) & (iii) District Tobacco Control Cell [DTCC subsumed in the flexipool for Non Communicable Diseases (NCDs) under the National Health Mission (NHM)].

3.2 State Tobacco Control Cell

Every identified State/Union Territory has a State Tobacco Control Cell in the State Health Department/ Directorate General of Health Services. The space for setting up the STCC is provided by the State Government.

The STCC is responsible for overall planning, implementation and monitoring of the different activities, and achievement of physical and financial targets planned under the programme in the State. The STCC is also responsible for documentation of activities, recruitment of staff at state/district level and sending timely activity as well as financial reports to the NTCC.

The STCC is headed by a State Nodal Officer, who is a Senior Officer from State Department of Health preferably on a full time basis, or may look after the NCD control programmes [e.g. National Programme for Prevention and Control of Cancer, Diabetes, CVDs and Stroke (NPCDCS), NTCP, National Mental Health Programme (NMHP), and National Programme for Health Care of the Elderly (NPHCE)]. This cell may operate under National Health Mission, within the State NCD Cell or as a part of the Health Department or Directorate General of Health Services, as the case may be, in the States/UTs. Every state/UT constitutes a State Level Coordination Committee (SLCC) headed by Chief Secretary or his nominee and Principal Secretary/Secretary (Health) as the member secretary. The State Nodal Officer (NTCP) extends support to the member secretary in convening the meetings of the SLCC. This committee is responsible for overall implementation of the National Tobacco Control Programme and provisions of COTPA in the state.

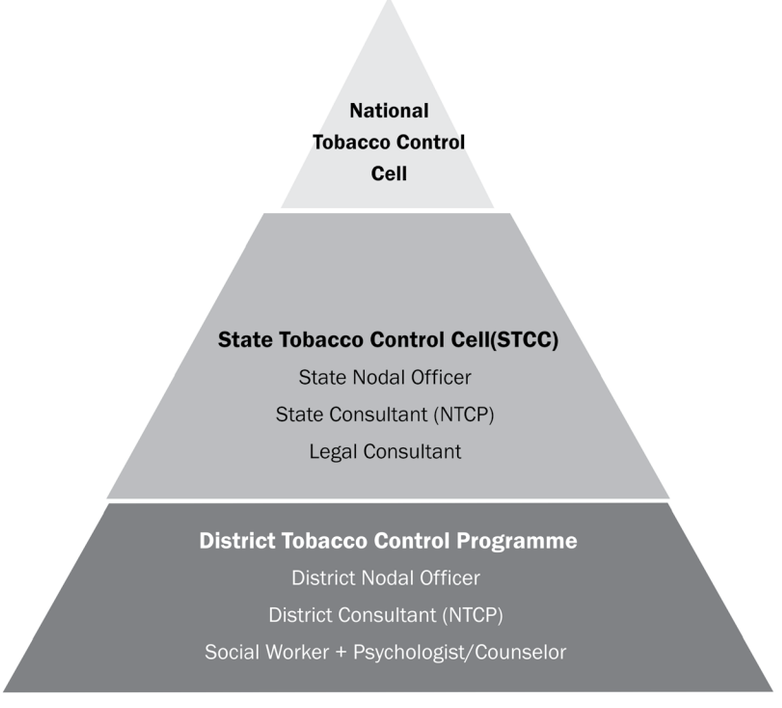

Figure 1: Three-tier structure of implementation of National Tobacco Control Programme

There is provision of recruiting two contractual staff at the state level to assist the State Nodal Officer in tobacco control initiatives. The two personnel are State Consultant and Legal Consultant/ Finance Consultant.

The National Tobacco Control Cell (NTCC) at the Ministry of Health and Family Welfare, GoI supervises the overall implementation of the programme in the country.

3.3 Roles and responsibilities of the STCC

Roles and responsibilities of the STCC are as given under:

1. Implementation, supervision and monitoring of various activities of NTCP at State & District level.
2. Recruitment of the staff at the state /district tobacco control cell, training of the staff and guidance to the district cells.
3. Establishing tobacco cessation clinics in health care facilities and capacity building in tobacco cessation.
4. Organizing state level training/sensitization programmes on tobacco control.
5. Sharing and disseminating government orders and best practices to the districts.
6. Enforcement of COTPA:
    - Display the Act and the Rules on the official website of the state and regular communication to all the officers of other departments who have been authorized for enforcement of the various provisions of the Act and the Rules
    - Ensure printing of challan and receipt books and sending the same to districts/ concerned authorities. The revenue generated from Challan may preferably be used for tobacco control activities using appropriate mechanisms.
    - Constitute a State Level Coordination Committee (SLCC) and organize regular meetings.
    - Conducting regular checks at public places, public transport, point of sale etc. for compliance of COTPA provisions.
7. Adapting IEC materials developed by NTCC and disseminating it to districts.
8. Advocacy and networking with NGOs at the state and district level for awareness generation regarding prevention and control of tobacco.
9. Coordination with Departments of Agriculture, Social Welfare, Rural Development, Labour and other stakeholders for developing sustainable alternative crops and livelihood for tobacco growers/ workers and bidi rollers.
10. Coordination with the Finance / Taxation Department for progressive increase on tobacco tax and with Department of Education for protecting the youth from initiating use of tobacco products.
11. Networking and developing synergies with other health and development programmes at state level.
12. Documentation of the best practices on tobacco control in the state and sharing within the state beyond.

3.4 District Tobacco Control Cell

The District Tobacco Control Cell (DTCC) is established in a district under the umbrella of the District Health Society. The space for setting up the DTCC is provided by the district authorities. The cell is the focal point for all the activities carried out under the National Tobacco Control Programme (NTCP) at the district and sub-district levels. DTCC is responsible for overall planning, implementation, and monitoring of different activities to achieve physical and financial targets under the programme. The role of the DTCC is extremely crucial as most of the activities under the NTCP are to be implemented at district and sub-district levels.

The DTCC is headed by a District Nodal Officer, preferably Chief Medical Officer/Civil Surgeon of the district on a full time basis. For achieving synergy, it is desirable that the District Nodal Officer under NTCP is also given the responsibility to look after the NCD programmes like Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke (NPCDCS), National Mental Health Programme (NMHP), National Oral Health Programme and National Programme for Health Care of Elderly (NPHCE). Other team members of this cell include a District Consultant, a Psychologist /Counselor and a Social worker, appointed on a contractual basis under the NTCP. Every District constitutes an enforcement squad preferably under the Collector/

District Magistrate (DM). The squad is responsible for monitoring compliance with the tobacco control laws in the jurisdiction and for taking action against any violations in the district.

Each district has a District Level Coordination Committee (DLCC) chaired by the Collector or District Magistrate. The District Nodal Officer is the member secretary and convenes regular meetings of the Committee.

3.5 Role and responsibilities of DTCC

The major role and responsibilities of the District Tobacco Control Cell (DTCC) are:

1. Training and Capacity Building of relevant Stakeholders

Training and capacity building is an important activity of DTCC. The Cell organizes training programmes for multiple-stakeholders in the district, which include Doctors, Nurses, Community Health Workers, ASHAs, Civil Society Organizations, NCC, NSSO, IMA, IDA, Teachers, officials from Enforcement Departments like Police, Food Authorities, Municipal officers etc.

2. School Awareness Programmes

School awareness programmes are conducted to help the youth and the adolescents to acquire the knowledge, attitude and skills that are required to make informed choices and decisions and understand the consequences of tobacco use. It empowers students to contribute to the creation of tobacco-free environment in which they can learn and live. It is important to sensitize children at an early age and reinforce the same message at later stage.

There are two models in school programme : i) integrate tobacco control activities in the schools already having /existing school health programme (can also collaborate with other programmes such as Rashtriya Kishor Swasthya Karyakram in this regard); and ii) initiate tobacco control programmes in 70 schools in a district in a year

3. Setting up and expansion of tobacco cessation facilities

Tobacco contains nicotine which is a highly addictive substance and leads to chronic nicotine dependency. To overcome this dependency, the tobacco users need help and counseling to gradually quit tobacco use. Thus, death and debilitating disease due to tobacco use can be reduced significantly through an increased emphasis on cessation programmes.

One Counsellor/ Psychologist is provided in each Tobacco Cessation Centre (TCC) established under the NTCP at the district level. The centre is supported by basic equipments for running the clinic. Certain equipments like Carbon Monoxide monitor and Spiro-meter are useful in monitoring effective cessation services. A separate non-recurring grant of Rs. 250,000 has been provided under the TCC budget for procurement of equipments for setting and running the TCC under the NTCP. Space is also an important factor for running a TCC effectively - there should be enough privacy for the patients to sit and to discuss the problems with the Counsellor/ Psychologist. In the 12th FYP period, there is a separate provision of Rs. 200,000 per year under the DTCC budget for providing Pharmacological Treatment of Tobacco Dependence at the district level.

Community-based counseling is an effective strategy for primordial prevention and also for helping smokers to quit or in preparing them to quit. The tobacco cessation services work best when supported by a comprehensive community-based counseling. For this purpose, the households having tobacco users are listed for regular follow up and one to one interaction may be carried out to encourage the tobacco users for complete cessation. A robust referral system, facilitating referral of patients/ tobacco users from the periphery to the district hospital should be in place.

4. Public Awareness through IEC and mass media

The District Tobacco Control Cell uses a mix of media methods to reach different target audience. The message on harmful effects of tobacco use are communicated through health melas, billboards, hand bills, posters, street plays, local cable network, wall writings, traditional/folk media etc. Specific IEC strategies are developed by the DTCC keeping in consideration the local needs. The support of NGOs and other partners is enlisted and plays an important role in organizing IEC activities. The district teams synergize their campaign with the national level media campaign. To make the campaigns cost effective, the IEC material developed at the national level is sent to states/ districts for adaptation/translation in local language.

5. Monitoring the enforcement of Tobacco Control Law

Every district has enforcement squads/ teams that are responsible for regular enforcement drives/raids to monitor any violation of the provisions of COTPA. Regular raids are conducted in public places like public transport, restaurants, government buildings, health facilities, educational institutions etc. On the issue of formation of these enforcement squads/ teams and conducting regular periodic raids, the Department of Health should take the lead in collaboration with the Department of Home Affairs. The collected amount from the penalties should be deposited in a separate head of account. It is recommended that the funds so generated should be further utilized in tobacco control initiatives or awareness campaigns in the state/district.

4. Additional intervention/ efforts

A "National Consultation on Tobacco Economics" was organized by the MoHFW in December 2012. The consultation dwelt into three issues of economics of tobacco use - the health cost of tobacco use; the alternative livelihood to tobacco farmers and bidi rollers; and the tobacco taxation. The study titled "Economic Burden of Tobacco Related Diseases in India" was undertaken based on the recommendations of this consultation and revealed that the total economic costs attributable to tobacco use from all diseases in India in the year 2011 for persons aged 35-69 amounted to Rs. 104,500 crores - approximately US$ 22.4 billion. Remarkably, this came out to be 1.16 percent of the GDP and 12 percent more than the combined state and central government expenditures on health in India in the year 2011-12. The total central excise revenue from all tobacco products in the year 2011-12 in the country amounted to only 17 percent of the estimated economic costs of tobacco.

Health spots related to harmful effects of tobacco use are displayed by films and TV Programmes displaying tobacco products or their use, as per the Rules notified under COTPA 2003. As per the Rules, every movie or TV programme which depicts tobacco product or its use shall provide 100 seconds of free airtime for two spots of '30 seconds' duration and general disclaimer of '20 seconds' duration in the beginning and middle of the films and TV Programmes. India is one of the few countries in the world to regulate depiction of tobacco products or their use in films and TV Programmes. The implementation of 'Tobacco-free Movie Rules' in India, perhaps for the first time globally, has made available a huge quantum of statutory free airtime for airing anti-tobacco health spots and disclaimers through films and TV programmes.

In the process of implementation of NTCP in India, various lessons were learnt. They are:

- Policy coherence among various stakeholder departments at the national and state level is the key to effective tobacco control.
- Gaps in the tobacco control law allow the tobacco industry to continue subversive tactics e.g., Designated Smoking Rooms (DSRs) are allowed in restaurants/hotels, Point of Sale (PoS) advertising is permitted, tactics to circumvent ban on Gutkha etc.
- Enforcement of Public Health laws is not a priority at the State level.
- New tobacco products and means of consumption e.g. Electronic Cigarettes and Hookah Bars are emerging as major threats, especially for youth.

Therefore, Implementation of tobacco control policies and programmes at the ground level, in the realm of emerging complexities is a challenge for the implementers at all levels. Participation by multiple stakeholders and synergy with other health programmes is the key to overcome challenges of tobacco control and countering the mighty tobacco industry.

Summary

India is the second largest consumer of tobacco in the world. Almost one million lives are lost annually due to tobacco use. Tobacco prevention and control are implemented through law (COTPA, 2003), WHO FCTC and National Tobacco Control Programme. The main thrust areas for the NTCP are as follows:

(i) Training of health and social workers, NGOs, school teachers, and enforcement officers;

(ii) Information, education, and communication (IEC) activities;

(iii) School programmes;

(iv) Monitoring of tobacco control laws;

(v) Setting-up and strengthening of cessation facilities

The NTCP has established structure and mechanisms at the national, state and district level. There is scope of synergies and networking with other health programmes, National Health Mission and sectors outside health for achieving effective tobacco control.

Unit Review Questions

1. What is the burden of tobacco use in India?
2. Is smokeless tobacco use constitutes a major challenge for India?
3. What are the main provisions under COTPA?
4. Enumerate demand reduction strategies for tobacco control as per WHO FCTC.
5. List the thrust areas under NTCP.
6. What are the different components of District Tobacco Control Programme?

Application question/ Assignment

1. You are the District Tobacco Control Officer for a district in Maharashtra. List the actions you will undertake to establish tobacco cessation facilities in the district.

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Suggested Readings

1. WHO FCTC Available at: http://whqlibdoc.who.int/publications/2003/9241591013.pdf?ua=1
2. GATS India, 2010 Available at: http://mohfw.nic.in/WriteReadData/l892s/1455618937GATS%20India.pdf
3. COTPA, 2003 and NTCP Law Enforcers Manual Available at: http://www.mohfw.gov.in/WriteReadData/l892s/Law%20Enforcers%20Manual.pdf
4. Operational Guidelines for National Tobacco Control Programme, 2015 Available at: http://www.mohfw.gov.in/WriteReadData/l892s/Operation%20Guidelines.pdf
5. WHO MPOWER Strategies Available at: http://www.mohfw.gov.in/WriteReadData/l892s/WHO%20mpower%20Strategy.pdf
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CHAPTER 8

NATIONAL AND SUBNATIONAL LEVEL TOBACCO USE RELATED DATA SOURCES IN THE SOUTH-EAST ASIA REGION

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Describe the various sources of data available for tobacco prevalence in the countries of South East Asia Region.
2. Delineate the salient features of each data source and its appropriate use for tobacco control.
3. Appraise the strengths and limitations of the discussed data sources.

KEY TERMS

Data sources, tobacco use, GYTS, GATS

1. Introduction

Tobacco use has been established as the cause for a significant proportion of disease burden in both developed and developing nations.[1] A growing incidence, in the past few decades, of cardiovascular diseases such as acute coronary syndrome, stroke and peripheral vascular disease has been attributed to concomitant increase in tobacco usage in the South East Asia Region (SEAR).[2–4] Many international agencies including the World Health Organisation (WHO) have mooted into action a number of tobacco control activities. A significant achievement in this direction was the introduction and ratification of the Framework Convention on Tobacco Control (FCTC) by several member countries of the United Nations.[5] One of the major hurdles in the fight against tobacco epidemic prior to the 90s was the lack of nationally representative robust data. The WHO developed the MPOWER concept, a six component strategy that if followed can be used to achieve and monitor the FCTC commitments.[6] This created an opportunity and necessity to conduct nation wide tobacco related surveys. The aim of this chapter is to review the various tobacco use related national and subnational level surveys conducted in the WHO-SEAR countries in terms of their objectives, methodological issues, range of tobacco topics covered, timing of survey and their limitations and strengths in order to inform policies regarding future Tobacco Surveillance Systems.

2. Description of the data sources

2.1 Global Tobacco Surveillance System (GTSS) surveys

The GTSS surveys namely the Global Adult Tobacco Survey (GATS), the Global Youth Tobacco Survey (GYTS), the Global School Personnel Survey (GSPS) and the Global Health Professions Student Survey (GHPSS) are the most commonly conducted. These are specialised tobacco surveys specifically relating to tobacco topics in specific populations. They employ a multi-stage cluster, Population Proportional to Size (PPS) sampling design, meaning that they are largely representative of the study populations. All are cross-sectional surveys, but repeated at intervals within the same country to produce a time series data. Among these surveys GATS is the only household based survey, rest of them are institution-based surveys; GYTS and GSPS are conducted in schools and GHPSS are conducted in medical and paramedical colleges. They use a standardised validated questionnaire and employ strict quality control measures. The questions are interviewer-administered in GATS, whereas self-administered in the other three. The range of topics covered is most extensive in GATS, which is directed to the general public and in GYTS, which is directed towards school going young students. GSPS and GHPSS have limited topics but cover themes specific to the study population such as access to teaching materials for school personnel and smoking cessation-counselling techniques among health profession students. GATS and GYTS are adequately geared to monitor the WHO MPOWER components, whereas GSPS and GHPSS have limited scope in this respect.

2.2 World Health Surveys (WHS)

The subject matter of this survey varies from country to country depending on their health priorities, however in the five countries of the SEAR a few tobacco related questions such as prevalence, duration, types, volume and frequency of smoking are incorporated. Consequent to the limited scope, they have limited ability to provide data for FCTC monitoring. They are household, national level, cross-sectional surveys with non-institutionalised adults aged more than 17 years as the eligible population. They adopt a stratified multistage cluster sampling strategy. Questions are interviewer administered and in some countries they use of electronic data capture methods to improve data quality.

2.3 Global School-based student Health Surveys (GSHS)

This is a collaborative surveillance project designed to help countries measure and assess the behavioural risk factors and protective factors in 10 key areas among young people aged 13 to 17 years.[7] The questionnaire has core, core-expanded and country specific modules. In a sense they are similar to the GYTS as they are school based, self-administered and nationally representative but they differ in having a broader focus on adolescent health related issues and include a wider age group. They adopt a stratified multistage cluster sampling strategy. They have been carried out in most SEAR countries. However, in some countries like Bhutan the survey did not collect tobacco related data. Their coverage of tobacco topics is limited to prevalence, frequency, intensity, attitude, motivation and quit attempts but this is not uniform across all countries.

2.4 WHO-STEP Surveys

In order to respond to the growing burden of Non-Communicable Diseases (NCD), WHO introduced the STEPS survey instrument to determine the distribution of NCD risk factors such as tobacco use, alcohol consumption, low fruit and vegetables intake, low physical activity, obesity, hypertension and diabetes mellitus. The surveys are usually carried out in a stepwise fashion; Step 1 involved collection of basic information with questionnaires, Step 2 involved physical measurements and Step 3 involved blood sampling and biochemistry. Most of these are household-based surveys with certain components such as anthropometry and blood sampling being carried out in clinic settings. Non-institutionalised adults aged 25 and above constitute the eligible population but in some countries age ranges differ. They employ a stratified multi stage cluster PPS sampling strategy. Their sample size assumptions are based on key risk factor prevalence with a minimum sample size of 2000. Since these surveys are conducted mostly at the local or regional level they are not broadly representative of the nation but are highly valid at the local level. The emphasis is on small but high quality data. The questionnaire is interviewer administered with standardised tools and quality control mechanisms built in. The scope of the tobacco related components is complete but divided into core, expanded and policy modules. The comprehensiveness of topics covered in the WHO-STEPS instrument makes it adequately poised for monitoring all MPOWER components. A point specific to STEPS surveys is that countries use them

in a manner that they seemed fit to their needs. They sometimes incorporate the STEPS questions into their national health survey as exemplified by Indonesian Surkesnas[8] and sometimes they have carried it out in hospital settings such as that done by Bhutan in a medical college hospital.[9] Indonesia also incorporated STEPS survey into a community intervention programme. whereas, India included a wider age group than that recommended.[10,11]

2.5 Demographic and Health Surveys (DHS)

Low–and middle-income countries, where routine health information is scare and unreliable, conducts Demographic and Health Surveys (DHS) periodically. These surveys serve as important sources for the health planning of a country since they are carried out throughout the country and provide representative data. However, their primary focus areas are Maternal and Child Health (MCH). Sometimes a few tobacco related questions are also incorporated in these surveys to understand current trends. They are household based, interviewer administered and cross-sectional surveys. The eligible population differ in terms of age range and gender between countries and also between surveys in a country, but generally they include only adults in the reproductive age group. They employ in most cases a multi stage stratified random PPS sampling strategy. Tobacco questions are usually concerned with prevalence, product types, frequency, second hand smoke and peer influence and therefore limited in scope to monitor FCTC rules.

2.6 International Tobacco Control (ITC) study

The ITC study is a prospective cohort survey designed to evaluate tobacco control policies in Bangladesh, Bhutan, India, Thailand and few other countries outside the WHO-SEAR. The surveys are near national level in Bangladesh and Thailand and subnational in India and Bhutan. They are interviewer administered household based and have in built quality control mechanisms. After a baseline survey, follow-ups are conducted at 2- and 4-year intervals. Eligible population consists of non-institutionalized adults aged 18 years and above and youth aged between 13 and 17 years in Thailand, aged 15 or more in India and Bangladesh and aged 18 or more in Bhutan. The sampling strategy involves a stratified multistage design with PPS in the initial stages and cluster and quota sampling in the last stages. Since prefixed quotas are required to be filled in each category they are representative of the sampled population only. Tobacco topics covered are smoking and quitting behaviour , smoke-free public places, and workplaces, health warning labels, tobacco advertising, promotion, and sponsorship, education, communication, and public awareness, tobacco price, and taxation and illicit cigarette trade which are adequate to monitor most MPOWER components.

2.7 Country specific surveys

The countries like India, Indonesia, Myanmar, Sri Lanka and Thailand have conducted country specific surveys regularly over a period of time. These include both national and subnational level surveys. In India, the country specific surveys include National Sample Survey Organisation (NSSO) household consumption and expenditures surveys which also collect some data on tobacco use; the Sample Registration System (SRS) and a National Household Survey on Drug and Alcohol Abuse.[12–14] In Indonesia, there is a wealth of tobacco related data collected through its regular survey activities such the Indonesia Family Life Survey (IFLS), basic health research (Riskesdas), national socioeconomic survey (Susenas), and national health surveys (Surkesnas).[8,15–17] Such surveys collect tobacco use data only in specific years. In Myanmar, a series of sentinel surveys provide national level data at regular intervals. In Sri Lanka, spot surveys conducted twice a year in different regions of the country form a warehouse of tobacco data. Thailand has probably the most extensive network of surveys that have a tobacco component; the health and welfare surveys conducted annually or in alternate years have limited items, whereas specialized behaviour surveys known as Smoking and Alcohol Drinking Behaviour Survey of the Population provides detailed and regular data at the national level; National Health Examination Surveys and NCD risk factors surveys.[18] Youth Risk Behaviour Surveys at the subnational level.[18, 19] Bangladesh and Nepal have occasional surveys at national and subnational levels to supplement data for tobacco control activities.

3. Discussion

Compared to the early 90s period, a significant amount of data on tobacco has been made available through these surveys in recent years. Now, we have atleast two data points in time for most indicators in every country to make a trend comparison. A great impetus to this data generating exercise has been partly due to the active participation of international agencies like the WHO and CDC and the health ministries of these

countries.[20] In the next few subsections, we will brief you about the utility, comparability and strengths and limitations of various surveys conducted in relation to tobacco control.

3.1. Utility of the surveys

The surveys described above have certain commonalities that make them suitable to be viewed together across populations, regions, and countries. (Boxes 1-4) Only GTSS surveys and ITC study are specifically designed for the purpose of collecting tobacco data.[21,22] Other surveys have an underlying theme within which tobacco use is incorporated as one of the components, for e.g., the WHO-STEPS survey is a NCD risk factors surveillance instrument, DHS is MCH oriented, and WHS is general health oriented.[23–25] All surveys with the exception of GYTS, GSPS, GHPSS and GSHS are household based surveys. Most surveys cover many countries of the WHO-SEAR, however the ITC study and GATS cover only WHO-SEAR four countries.[26–30] Although most countries have data from more than one type of surveys, DPR Korea has data only from the WHO-STEPS surveys and Bhutan has data only from GYTS/ GSPS and ITC study.[31–33] Resource constraints and political motivation are differential political will for this uneven distribution of research studies across these countries. Most of the surveys have a robust methodology in terms of sound assumptions for sample size calculations, use of standardised questionnaires, adequately trained interviewers and quality control mechanisms. In certain instances, surveys such as the WHO-STEPS, WHS and GATS are carried out using electronic methods to reduce errors. Most surveys used a multistage, stratified, cluster and PPS sampling methods that ensure representativeness and generalizability to the population at large. GYTS, GSPS, GHPSS and GSHS include special populations, school going young persons, school personnel and health profession students, to meet specific objectives and therefore are not generalizable to the whole population.[34–40] GATS, GYTS, WHO-STEPS and ITC study are among the most comprehensive surveys that include a wide range of tobacco topics.[22,26–29,34,41–46] However, DHS and WHS have basic indicators such as prevalence, types, volume and frequency and their associations with socio-demographic factors like wealth.[47–63] Country specific national surveys that are conducted at frequent intervals provided a wealth of data and are probably well suited for trend analysis and have the potential to provide quick feedback to implementation of control activities. However, their main focus is on broader health issues.

3.2 Comparability of the surveys

In terms of comparability, the GATS and WHO-STEPS surveys and, the DHS and the WHS are more similar to each other than to others. The ITC study is an odd one out in that it is a prospective cohort study.[22,64–66]Time trends for a number of tobacco variables within a country could be extracted from GATS and WHO-STEPS surveys.[26,43,67,68] Time trends for basic tobacco indicators such as prevalence and product types can be obtained from most of these surveys including DHS and WHS. Countries that have carried out similar surveys with fairly similar methodologies such the GATS, WHO-STEPS, WHS and DHS within comparable time periods could be used for cross-country comparisons. Country specific surveys that are repeated at regular intervals at the national level using similar methodology (such the Riskedas, Susenas, Surkesnas, health and welfare surveys, family life surveys, sentinel prevalence surveys, risk factor surveys) are comparable to each other and could serve well for within country trend comparisons.

3.3 Strengths and limitations of the surveys

These surveys have several strengths. They involve large sample sizes, which are largely representative of the population they intend to study, are conducted at fairly regular time intervals, and complement each other in that they are spread across time periods and rarely overlap with each other, use standardised and nearly comparable sampling methodology and standardised validated questionnaires. In isolation each type of survey provides limited information, whereas if considered together they have the potential to transform into a valuable data repository for each country with their individual strengths put together and their weakness being overcome by the others. There are a few limitations that need to be considered before using these survey data in a collective manner. Firstly, none of the surveys include institutionalised person such as those in dormitories, hostels, army barracks, other organisations and hospitals. The WHS has made an attempt to capture hospitalised patients by following them up for upto two weeks at their homes.[69] It has been pointed out that persons in institutions may have a higher prevalence of tobacco use and this might lead to underestimation of the overall population indictors.[70] Sometimes, in surveys such as the DHS women are not asked about tobacco use for cultural reasons and are restricted to the reproductive age groups, which further limit the generalizability to the population at

Table 1. Comparison of various survey types by their aims, range of tobacco topics and FCTC monitoring usefulness

	Primary objective	Range of tobacco topics	FCTC monitoring	Limitations	Strengths	Special Features
GATS	Provide global standard to systematically monitor adult tobacco use and track key tobacco control indicators	Prevalence of tobacco use (smoking and smokeless tobacco); exposure to second-hand smoke; cessation; the economics of tobacco; exposure to media messages on tobacco use; and knowledge, attitudes and perceptions towards tobacco use	Wide range	Non-institutionalised individuals excluded, cross-sectional nature	Standardized methodology, validated questionnaire, country level flexibility to add questions, cross-country comparison and trend analysis possible, sub-national estimates available, includes a wide age range	-
GYTS	Enhance countries' capacity to monitor youth tobacco use, guide national tobacco prevention and control programs, and facilitate comparison of tobacco-related data at the national, regional, and global levels	Prevalence of tobacco use, age of initiation, exposure to tobacco advertising, perceptions and attitudes on behavioural norms with regard to tobacco use among young people, media and advertising, legislation, economics, school curriculum, and Environmental Tobacco Smoke	Wide range	Limited to students attending school, data apply only to youths who were in school the day of the survey, based on the self-report by students	Standardized methodology, validated questionnaire, country level flexibility to add questions, cross-country comparison and trend analysis possible	Participants were young school students
GSPS	Collect information on tobacco use, knowledge and attitudes of school personnel toward tobacco, existence and effectiveness of tobacco control policies in schools, and training and materials available for implementing tobacco prevention and control interventions	Prevalence of tobacco use and attitude towards tobacco among school personnel, school policies prohibiting tobacco use, access to teaching materials and training	Limited	Limited to school personnel present on the day of survey in the selected school	Similar to GYTS	Participants were school personnel

	Primary objective	Range of tobacco topics	FCTC monitoring	Limitations	Strengths	Special Features
GHPSS	Collect information on prevalence of cigarette smoking and other tobacco use, knowledge and attitudes about tobacco use, exposure to second-hand smoke, desire for smoking cessation, and training received regarding patient counselling on smoking-cessation techniques among health professional students	Prevalence of cigarette smoking and other tobacco use, knowledge and attitudes about tobacco use, exposure to second-hand smoke, desire for smoking cessation, and training received regarding patient counselling on smoking-cessation techniques	Limited	Respondents were third year health profession students who did not have substantial interaction with patients, results cannot not be extrapolated to practicing health professionals, did not survey students in all health professions	Country-level data with regional level stratification possible, standardized methodology, validated questionnaire, country level flexibility to add questions, cross-country comparison and trend analysis possible	Participants were health profession students
WHS	Compile comprehensive baseline information on the health of populations and on the outcomes associated with the investment in health systems; baseline evidence on the way health systems are currently functioning; and, ability to monitor inputs, functions and outcomes	Prevalence of smoking status, daily smoking, duration of daily smoking types of smoking such as manufactured cigarettes, hand-rolled cigarette, pipefuls of tobacco, average daily consumption of each tobacco product	Limited	Very limited focus on tobacco related issues, subnational estimates not possible	Cross-country comparison possible, high response rates	-
GSHS	Help countries develop priorities, establish programmes, and advocate for resources for school health and youth health programmes and policies. Establish trends in the prevalence of health behaviours and protective factors by country for use in evaluation of school health and youth health promotion.	Prevalence of tobacco use, types, frequency, second hand smoke exposure, attitude, motivation for use, quit attempts (topics vary by country)	Limited	Limited focus on tobacco related issues	Cross-country comparison possible	Participants were young school students

	Primary objective	Range of tobacco topics	FCTC monitoring	Limitations	Strengths	Special Features
WHO-STEPS	Determine the distribution of NCD risk factors such as tobacco use, alcohol consumption, low fruit and vegetables intake, low physical activity, obesity, hypertension and diabetes mellitus. STEPS framework progresses sequentially, starting with collection of basic information using standardized questionnaires in Step 1, moving onto simple physical measurements in Step 2 and finally biochemical analysis of blood samples in Step 3	Core questions: Prevalence of tobacco use (smoking and smokeless tobacco), frequency, initiation, and cessation habits. Expanded: past smokers, smokeless tobacco use, and exposure to second-hand smoke. Policy module: the economics of tobacco, exposure to media messages on tobacco use	Wide range	Limited focus on tobacco, national level comparisons not possible based on regional data	Standardized methodology, validated questionnaire, country level flexibility to add questions, decide age groups, trend analysis possible if conducted in the same region over time	-
DHS	Provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition	Prevalence of tobacco use including smokeless and smoking tobacco, types of products used, frequency of usage, second hand smoke, peer pressure	Limited	Primary objectives are mainly related to maternal, child and reproductive health, limited focus on tobacco topics, sometimes only females or males surveyed	Large representative sample, several other lifestyle variables collected which can be used to find associations	Primarily focussed on women and child health
ITC study	Examine the prevalence and patterns of smoking behaviour, examine the impact of specific tobacco control policies, compare smoking behaviour and the impact of policies with other countries and measure the uptake of tobacco use among young people	Smoking and quitting behaviour , smoke-free public places and workplaces , health warning labels , tobacco advertising, promotion, and sponsorship, education, communication, and public awareness, tobacco price and taxation and illicit cigarette trade	Wide range	Limited data on types of tobacco products, smokeless tobacco use in certain countries	Cohort study, trend analysis possible, focus on tobacco control policies	Smokers selected separately to estimate quitting rates

	Primary objective	Range of tobacco topics	FCTC monitoring	Limitations	Strengths	Special Features
Country specific surveys						
Impact of tobacco-related illnesses (Bangladesh)	Determine the economic costs of illnesses resulting from tobacco usage in Bangladesh	Types of tobacco usage, prevalence of tobacco-related illnesses, utilization of health services, economic cost of tobacco related illnesses, deaths and disabilities due to tobacco-related illnesses, impact of second-hand smoking, tobacco economics	Limited	Lack of generalizability to the whole country	Topics such as tobacco-related illnesses, out-of-pocket expenditure due to tobacco use related hospital admissions, health system cost, benefit of tobacco use to the economy have been studied which are not present in other surveys	Focussed on economic aspects of tobacco
NSSO survey (India)	Collect data on household consumer expenditure with occasional special topics such as tobacco use	Types of tobacco products i.e., smoking, chewing of tobacco, use of snuff, and use of burnt tobacco powder or paste and quantity and expenditure on tobacco	Limited	Very limited focus on tobacco related issues	Large representative country wide sample	Focussed on household consumption of products
SRS (India)	Provide reliable estimates of birth rate, death rate, infant mortality rate, measures of fertility and mortality including total fertility, infant and child mortality rate, causes of deaths and risk factors (smoking, alcohol drinking)	Prevalence of tobacco use including smokeless and smoking tobacco, types of products used, age at initiation	Limited	Very limited focus on tobacco related issues	Large representative country wide sample	Focussed on vital statistics and fertility indicators
NHSDAA (India)	Determine the prevalence of lifetime and current use of various drugs, estimate the extent of drug dependence and their socio- demographic correlates	Types of drugs abuse, demography of respondents, diagnosis of abuse and dependence	Limited	Very limited focus on tobacco related issues, only males studied	Large representative country wide sample	Focussed on illicit drug abuse
IFLS (Indonesia)	Provide data at the individual and family level on fertility, health, migration and employment	Prevalence of types of tobacco smoking	Limited	Very limited focus on tobacco related issues	Longitudinal study, conducted at regular intervals provide valuable cohort data	Focussed on socio-economic changes over time

	Primary objective	Range of tobacco topics	FCTC monitoring	Limitations	Strengths	Special Features
National health survey – Surkesnas (Indonesia)	Integrate all national health surveys (National Household Health Survey (NHHS), National Socio-Economic Survey (NSES) and Indonesia Demographic Health Survey (IDHS)	Prevalence of types of tobacco smoking, age at initiation	Limited	Very limited focus on tobacco related issues	Representative sample	Collect NCD risk factors using WHO-STEPwise approach
BHR-Riskesdas (Indonesia)	Measure the prevalence of infectious and non-communicable diseases, biomedical indicators, the risk factors for infectious and non-communicable diseases, the responsiveness of health systems and mortality statistics and cause of death	Prevalence of types of tobacco smoking and quantity consumed	Limited	Very limited focus on tobacco related issues	Conducted regularly over time, large representative country wide sample	Focussed on broader health indicators
NSS - Susenas (Indonesia)	Measurement of population well being, household consumption data in areas such as education, health, economics, labour, housing, clean water, crime, leisure and mass media	Prevalence of types of tobacco use, age at initiation, household tobacco smoke exposure, household expenditure on tobacco, quantity of usage, quitting intention	Limited	Very limited focus on tobacco related issues	Conducted regularly over time, large representative country wide sample	Focussed on broader social and welfare indicators
Sentinel prevalence survey (Myanmar)	Build a database on prevalence of tobacco use for planning and evaluation of tobacco control interventions in Myanmar	Prevalence of types of tobacco use	Limited	Very limited focus on tobacco related issues	Conducted regularly over time	-
Study on tobacco economics (Nepal)	Generate national data on tobacco prevalence in Nepal	Prevalence of types of tobacco use, age at initiation, quantity and frequency, quitting, source of information on tobacco, household expenditure on tobacco, production and sale of tobacco, tobacco cultivation	Limited	Only 10 out 75 districts formed the sample	Major regions of the country studied	-

	Primary objective	Range of tobacco topics	FCTC monitoring	Limitations	Strengths	Special Features
Spot surveys (Sri Lanka)	Conducted biannually since 1998 to monitor and identify the prevailing trends and patterns related to tobacco consumption	Prevalence of types of tobacco use, age at initiation, reasons for use, quitting attempt	Limited	Smaller sample size, sampling units were changed in subsequent surveys	Conducted regularly over time may help trend analysis	-
HWS (Thailand)	n/a	n/a	n/a	n/a	n/a	n/a
Smoking and/ or alcohol drinking behaviour survey (Thailand)	n/a	n/a	n/a	n/a	n/a	n/a
NHES (Thailand)	Determine prevalence of selected risk factors and non-communicable diseases	Prevalence of tobacco smoking	Limited	n/a	n/a	Focussed on the broader issues of NCD risk factors
Thai Food Consumption Survey (Thailand)	Obtain food consumption data including type and amount of food commonly consumed by the Thai population	Prevalence of cigarette smoking, age at initiation and quitting and quantity smoked	Limited	Very limited focus on tobacco related issues	-	Focussed on food consumption patterns
Interasia study (Thailand)	Obtain estimates of the levels of major cardiovascular risk factors, and the prevalence of vascular diseases, among adult populations of Thailand	Prevalence of tobacco smoking	Limited	Very limited focus on tobacco related issues	-	Focussed on CVD and their risk factors
BRFNCD (Thailand)	Monitor and assess behavioural risk factors for NCD and injuries and availability and accessibility of health services	Prevalence of smoking, age at initiation, types of products, quitting attempts, law enforcement, and the perception of people on smoking	Limited	Cross-sectional nature	Conducted regularly over time, large representative country wide sample, wider coverage of tobacco topics	Focussed on the broader issues of NCD risk factors

	Primary objective	Range of tobacco topics	FCTC monitoring	Limitations	Strengths	Special Features
Youth Risk Behavior Survey (Thailand)	Identify the current health status of adolescents in Bangkok and their health-risk behaviours and related risk factors. Develop an effective and practical adolescent health record form for surveillance and identification of adolescents at risk	Prevalence of cigarette smoking, frequency, intensity, motivation to use, place of purchase, quitting attempts	Limited	Limited focus on tobacco topics, subnational, cross-sectional	Useful for planning health promotion, risk prevention, and early intervention in Bangkok adolescents	Focussed on the broader issues of youth risk factors

Note: GATS - Global Adult Tobacco Survey,
GYTS - Global Youth Tobacco Survey,
GSPS - Global School Personnel Survey,
GHPSS - Global Health Professions Student Survey,
GSHS - Global School-based Student Health Survey,
WHS – World Health Survey,
WHO-STEPS - World Health Organisation-STEPwise survey,
DHS – Demographic and Health Survey,
ITC – International Tobacco Control Policy Evaluation Project,
NSSO – National Sample Survey Organisation survey on tobacco use,
SRS - Compendium of India's fertility and mortality indicators, 1971-2007, based on the Sample Registration System,
NHSDAA - National Household Survey Of Drug and Alcohol Abuse,
IFLS - Indonesia Family Life Survey,
BHR - Basic Health Research,
NSS - National Socioeconomic Survey,
HWS - Health and Welfare Surveys,
NHES - National Health Examination Survey,
Interasia study - cardiovascular risk factors in urban and rural Thailand- the international collaborative study of cardiovascular diseases in Asia,
BRFNCD - Survey results ofbehavioral risk factors of non-communicable diseases and injuries,
NCD – Non-communicable diseases,
CVD Cardiovascular diseases,
n/a – information not available

Table 2. Comparison of various survey types by their methodology

	Scope of survey	Participant characteristics	Sampling methodology	Sample size details	Representativeness	Data collection & quality control
GATS	Household-based, national, cross-sectional	Non-institutionalized persons aged 15 and above, who resided in the country and agreed to participate in this survey	Multistage stratified cluster sampling design in which the probability of a given cluster being selected based on PPS	A minimum sample size of 8000 households in each country was recommended so that any prevalence estimate of less than 40% would have a 95% margin of error of no greater than 3 percentage points with exceptions in certain countries	Representative of the population at large	Interviewer administered face-to-face interview with strict quality assurance measure, wherever appropriate same-sex interviewers were employed
GYTS	School-based, national and subnational, cross-sectional	Students aged 13–15 years	Multistage cluster sample design. Schools selected with probability proportional to school enrolment size during the first stage, and then classes within participating schools selected as a systematic equal probability sample	A minimum of 1500 completed student interviews is needed to obtain a precision level of ± 5% for a given estimate	Representative of only school going youth aged between 13 to 15 and persons who went to school on the survey date	Self-administered questionnaire, quality of data has been very high, consistency failures or out-of-range responses rarely exceed 5% per question
GSPS	School-based, national and sub-national, cross-sectional	School personnel (teachers and administrators)	Similar to GYTS, schools that participated in the GYTS were selected	All eligible school personnel (teachers and administrators) were interviewed in the schools selected for GYTS	Limited representativeness	Self-administered questionnaire
GHPSS	School/college-based, national, cross-sectional	Third-year students pursuing advanced degrees in dentistry, medicine, nursing, or pharmacy (public and private)	Multistage sample design with schools selected proportional to enrollment size and classrooms chosen randomly within selected schools or census of schools and students in countries with few health professional schools	All available personnel and willing to participate	Limited representativeness (did not include all types of health professions that could be involved in tobacco counselling)	Self-administered questionnaire

	Scope of survey	Participant characteristics	Sampling methodology	Sample size details	Representativeness	Data collection & quality control
GSHS	School based, national, cross-sectional	Students aged 13-17 years	Multistage cluster sample design. Schools selected with probability proportional to school enrolment size. May vary by country.	n/a	Representative of the school going students at the national level	Self-administered questionnaire
WHS	Household-based, national, cross-sectional	Non-institutionalised (except hospitalisations) male and female adults aged more than 17 years and who are not out of the country during the survey period	Multistage stratified cluster sampling, strata and cluster definitions vary across countries, but the WHS sets quality standards to obtain probability samples	Depending on the information needs and the amount of detail required, sample size may vary between 1000 and 10000 for each country	Externally as well as internally representative	Interviewer administered face-to-face interview with strict quality assurance measures
WHO-STEPS	Household-based, mostly subnational and national, rarely hospital based, cross-sectional	Non-institutionalized persons aged 25 and above, who resided in the country and agreed to participate in this survey (age group can be decided by each country)	Multistage stratified cluster sampling design using PPS	A minimum sample size of 2000 to ensure adequate power to detect trends in key risk factors by age and gender (with exceptions in certain countries)	Representative of the sampled population only	Interviewer administered face-to-face interview with strict quality assurance measures
DHS	Household-based, national, cross-sectional	Women aged 15 to 49 years and men aged 15 to 49 years or more (with exceptions), mostly ever married persons but sometimes all persons included	Multistage, stratified random sampling using PPS	Country specific, depends on MCH indicators	Representative of the population at large	Interviewer administered face-to-face interview with standardised questionnaire and strict quality assurance measures

	Scope of survey	Participant characteristics	Sampling methodology	Sample size details	Representativeness	Data collection & quality control
ITC study	Household-based, national, longitudinal cohort with follow-up surveys at 2 and 4 years. Subnational in India and Bhutan.	Non-institutionalized adults aged 18 years and above and youth aged between 13 and 17 years, country specific variations possible	Multistage stratified design, with inclusion probabilities proportional to size at the first few stages in each stratum. The next-to-last stage units were clusters of dwellings, each cluster having a quota of adult smokers, youth smokers and non-smokers to be filled	A minimum of 2000 adult smokers, 1000 youth smokers and/or tobacco users and non-smokers	Representative of the sampled population only	Interviewer administered face-to-face interview with strict quality assurance measures
Country specific surveys						
Impact of tobacco-related illnesses (Bangladesh)	Household-based, subnational, cross-sectional, hospital based and secondary data sources components	Persons aged 15 years and above	Random cluster design	11985 persons from 2467 households, 4 medical college hospitals	Representative of the sampled population only	Interviewer administered face-to-face interview with quality assurance measures
NSSO survey (India)	Household-based, national, cross-sectional	Persons aged 10 years and above	Multistage stratified sampling design, with census villages as first stage units in the rural sector and Urban Frame Survey (UFS) blocks in the urban	208248 persons from 115354 households spread over 11601 sample villages/ blocks	Representative of the population at large	Interviewer administered face-to-face interview with strict quality assurance measures
SRS (India)	Household-based, national, cross-sectional	Adults aged 15 years and above	Single stage stratified simple random sample without replacement except in larger villages of rural areas, where two stage stratification was followed	Infant Mortality is the decisive indicator for estimation of sample size, 10 to 15 percentage relative standard error, 1 million households, 7 million persons	Representative of the population at large	Interviewer administered face-to-face interview with strict quality assurance measures

	Scope of survey	Participant characteristics	Sampling methodology	Sample size details	Representativeness	Data collection & quality control
NHSDAA (India)	Household-based, national, cross-sectional	Non-institutionalised males aged 12-60 years	Two-stage stratified random sample using PPS	40,697 males	Representative of the population at large	Interviewer administered face-to-face interview with strict quality assurance measures
IFLS (Indonesia)	Household based, subnational, longitudinal cohort, four waves in 1993, 1997, 2000, 2007	Adults aged 15 years and above	Multistage stratified random sample with oversampling in some areas	13 of 27 provinces included, about 7000 households, 14418 persons	Representative of 83% of the population	Interviewer administered face-to-face interview with strict quality assurance measures
National health survey – Surkesnas (Indonesia)	Household-based, national, cross-sectional	Adults aged 15 years and above	Multistage systematic random sampling using PPS	About 13000 persons	Representative of the population at large	Interviewer administered face-to-face interview
BHR-Riskesdas (Indonesia)	Household-based, national, cross-sectional	Adults aged 10 years and above	Multistage cluster sampling using PPS and linear systematic sampling	381 households per district based on prevalence of 50%, z = 1.96 and d = 0.15, design effect of 2 and non-response of 10%. About 250,000 households and 900,000 persons	Representative of the population at large	Interviewer administered face-to-face interview with strict quality assurance measures
NSS - Susenas (Indonesia)	Household-based, national, cross-sectional	Persons aged 5 years and above, varies across time	Multistage systematic random sampling	Varies by indicator, around 50,000 and over	Representative of the population at large	Interviewer administered face-to-face interview with strict quality assurance measures
Sentinel prevalence survey (Myanmar)	Household-based	Adults aged 15 years and above	n/a	n/a	n/a	n/a

	Scope of survey	Participant characteristics	Sampling methodology	Sample size details	Representativeness	Data collection & quality control
Study on tobacco economics (Nepal)	Household-based, national, cross-sectional	Adults aged 10 years and above	Multistage systematic random sampling using PPS	Assuming 50% smokers in a household of 5.6 members, a total of 1400 households were sampled to cover 4000 persons. Included about 1400 households and about 6000 persons	Representative of the population at large	Interviewer administered face-to-face interview
Spot surveys (Sri Lanka)	Household-based, subnational, cross-sectional	Males aged 15 years and above	n/a	2465 persons	Representative of the sampled population only	Interviewer administered face-to-face interview
HWS (Thailand)	Household-based, national, cross-sectional	Persons aged 10 or 15 years and above	Multistage stratified sampling using PPS	Varies from survey to survey	Representative of the population at large	Interviewer administered face-to-face interview
Smoking and/or alcohol drinking behaviour survey (Thailand)	Household-based, national, cross-sectional	Persons aged 10 or 15 years and above	Multistage stratified sampling using PPS	Varies from survey to survey	Representative of the population at large	Interviewer administered face-to-face interview
NHES (Thailand)	Household based, subnational, cross-sectional	Non-institutionalised adults aged 15 years and above	Multistage systematic random sampling using PPS	Varies from survey to survey, approximately 30000 persons	Representative of the population at large	Interviewer administered face-to-face interview
Thai Food Consumption Survey (Thailand)	Household based, subnational, cross-sectional	Adults aged 18 years and above	Multistage stratified cluster sampling	About 8000 persons	Representative of the population at large	Interviewer administered face-to-face interview
Interasia study (Thailand)	Household based, subnational, cross-sectional	Adults aged 35 years and above	Multistage, stratified random sampling	About 5300 persons	Representative of the sampled population only	Interviewer administered face-to-face interview

	Scope of survey	Participant characteristics	Sampling methodology	Sample size details	Representativeness	Data collection & quality control
BRFNCD (Thailand)	Household based, subnational, cross-sectional	Non-institutionalised adults age 15 to 74 years	Multistage, stratified random sampling	37 provinces, 65542 persons	Representative of the population at large	Interviewer administered face-to-face interview with strict quality assurance measures
Youth Risk Behavior Survey (Thailand)	School based with a small community component, subnational, cross-sectional	School students in grades 7 to 12	Cluster random sampling of one classroom per grade (from grades 7 to 12) from each school to be recruited in the survey and 1% random sampling of teenagers from 13 different communities of those schools and a convenient sampling of 60 teenagers Juvenile Home Institutions	Calculated by assuming 95% confidence level and prevalence of substance abuse (3.3%), which is the lowest prevalence of common health problems among Bangkok adolescents. 1825 school students and 486 out of school teenagers	Representative of the sampled population only	Self-administered questionnaire

Table 3. Distribution of national survey types by country and year

	Bangladesh	Bhutan	DPR Korea	India	Indonesia	Maldives	Myanmar	Nepal	Sri Lanka	Timor-Leste	Thailand
GATS	2009	-	-	2009	2011	-	-	-	-	-	2009, 2011
GYTS	2007	2004, 2006 2009	-	2006 2009	2006 2009	2001 2004 2007 2011	2001 2004 2007 2011	2001 2007 2011	1999 2003 2007 2011	2006, 2009	2005, 2009
GSPS	2007	-	-	2006	2004	2007, 2011	2007, 2011	2001, 2007 2011	2003, 2007 2011	2006	2004
GHPSS	2005, 2006 2008, 2009	-	-	2005, 2007 2008, 2009	-	-	2006, 2009	2005, 2011	2006, 2011	-	2006, 2011
GSHS	2014	-	-	2007	2007	2009, 2014	2007	-	2008	-	2008
WHS	2003	-	-	2003	-	-	2003	2003	2003	-	-
WHO-STEPS	2010	-	-	-	2001	-	2009	2007, 2013	2006	-	-
DHS	2004, 2007	-	-	1998, 2005	2003, 2007 2012	2009	-	2001, 2006 2011	-	2009	-
ITC study	2009	-	-	-	-	-	-	-	-	-	2005
Country specific surveys											
NSSO survey (India)	-	-	-	1987, 1993	-	-	-	-	-	-	-
SRS (India)	-	-	-	2010	-	-	-	-	-	-	-
NHSDAA (India)	-	-	-	2000	-	-	-	-	-	-	-
IFLS (Indonesia)	-	-	-	-	1993	-	-	-	-	-	-

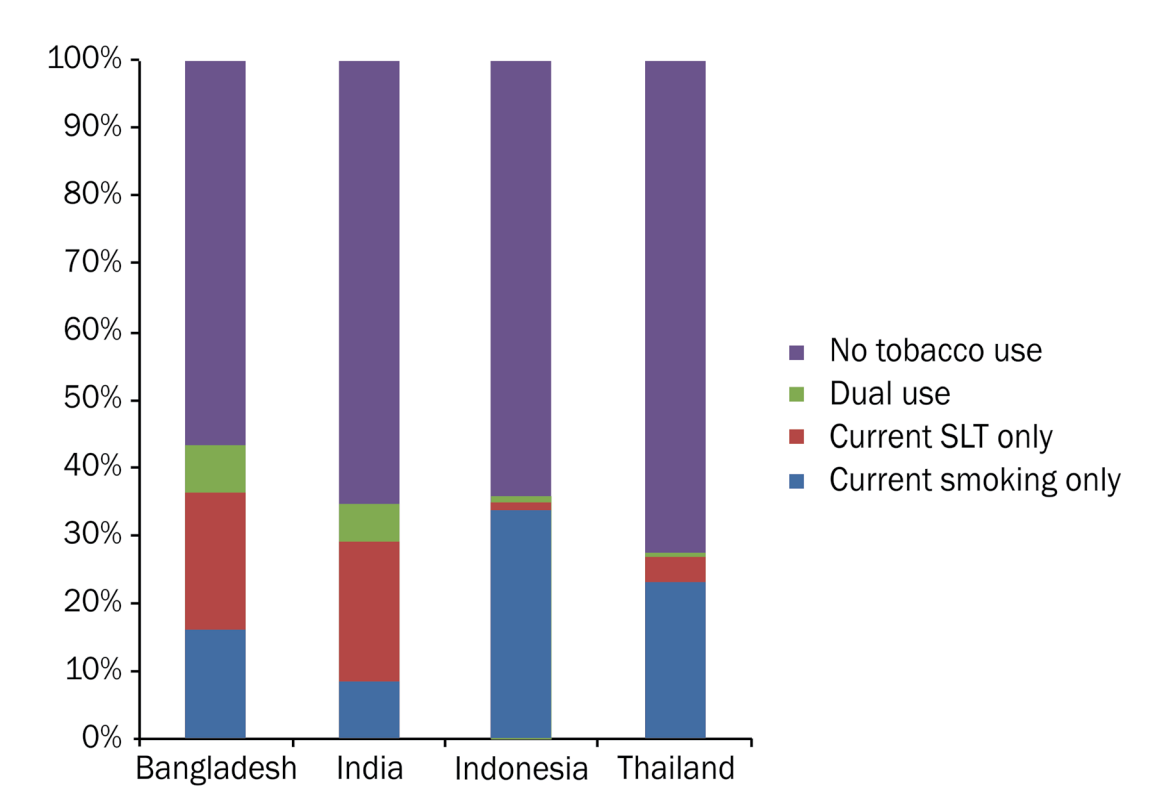
	Bangladesh	Bhutan	DPR Korea	India	Indonesia	Maldives	Myanmar	Nepal	Sri Lanka	Timor-Leste	Thailand
National health survey – Surkesnas (Indonesia)	-	-	-	-	1980, 1986 1995	-	-	-	-	-	-
BHR-Riskesdas (Indonesia)	-	-	-	-	2007, 2010 2013	-	-	-	-	-	-
NSS - Susenas (Indonesia)	-	-	-	-	1995, 2001 2004, 2007 2010	-	-	-	-	-	-
Sentinel prevalence survey (Myanmar)	-	-	-	-	-	-	2001, 2004 2007	-	-	-	-
Study on tobacco economics (Nepal)	-	-	-	-	-	-	-	2000	-	-	-
HWS (Thailand)	-	-	-	-	-	-	-	-	-	-	1976, 1981 1986, 1988 1991, 1993 1996, 2001 2003, 2006
Smoking and/or alcohol drinking behaviour survey (Thailand)	-	-	-	-	-	-	-	-	-	-	1988, 1999 2001, 2004 2007, 2011
NHES (Thailand)	-	-	-	-	-	-	-	-	-	-	1996, 2003 2009

Table 4. Distribution of sub-national survey types by country and year

	Bangladesh	Bhutan	DPR Korea	India	Indonesia	Maldives	Myanmar	Nepal	Sri Lanka	Timor-Leste	Thailand
GYTS	2004, 2007	-	-	2000, 2001 2002, 2003 2004	2000, 2004 2005	2003	-	2003, 2004	-	-	-
GSPS	-	-	-	-	-	-	-	2003	-	-	-
WHO-STEPS	2002	2004, 2007	2005, 2007 2008	2004, 2007	2003, 2006	2004, 2011	2004	2003, 2005	2003	-	-
ITC study	-	2009	-	2006	-	-	-	-	-	-	-
Country specific surveys											
Impact of tobacco-related illnesses (Bangladesh)	2004	-	-	-	-	-	-	-	-	-	-
Spot surveys (Sri Lanka)	-	-	-	-	-	-	-	-	1998-2013 (Biannually)	-	-
Thai Food Consumption Survey (Thailand)	-	-	-	-	-	-	-	-	-	-	2003
Interasia study (Thailand)	-	-	-	-	-	-	-	-	-	-	2000
BRFNCD (Thailand)	-	-	-	-	-	-	-	-	-	-	2007
Youth Risk Behavior Survey (Thailand)	-	-	-	-	-	-	-	-	-	-	2001

large.[58]Secondly, there are certain variations in the ways in which tobacco related questions are put to people in different surveys that might elicit variable responses from the same person. This limitation has to be borne in mind before any cross-survey comparisons are attempted.[71] One possible solution to this problem could be the adoption of a uniform set of standardised questions such as the Tobacco Questions for Surveys (TQS) or any other standard that can be agreed upon by all agencies conducting such surveys.[71] Also the face-to-face interview technique adopted by surveys, except GYTS, GSPS, GHPSS and GSHS is likely to be affected by the social desirability bias, especially in conservative countries like Indonesia and Bangladesh where tobacco use may be considered immoral and socially detestable.[72] Thirdly, the underlying theme of the survey would have affected the validity of tobacco estimates, for e.g., GATS and WHO-STEPS are specifically designed to capture tobacco indicators, whereas DHS, WHS and several of the national health surveys have tobacco only as a minor component in their questionnaires. This difference would limit comparability in terms of range of indicators available in each dataset. The WHO-STEPS instrument has been modified in many ways to meet country demands although this flexibility might be considered as a potential strength for cross-country or even within country comparisons. Finally, cross-sectional nature of the surveys limits the ascertainment of a temporal association between explanatory variables and outcomes. Also, the surveys may not have been repeated in the same populations

Box 1. Cross country comparison using GATS data

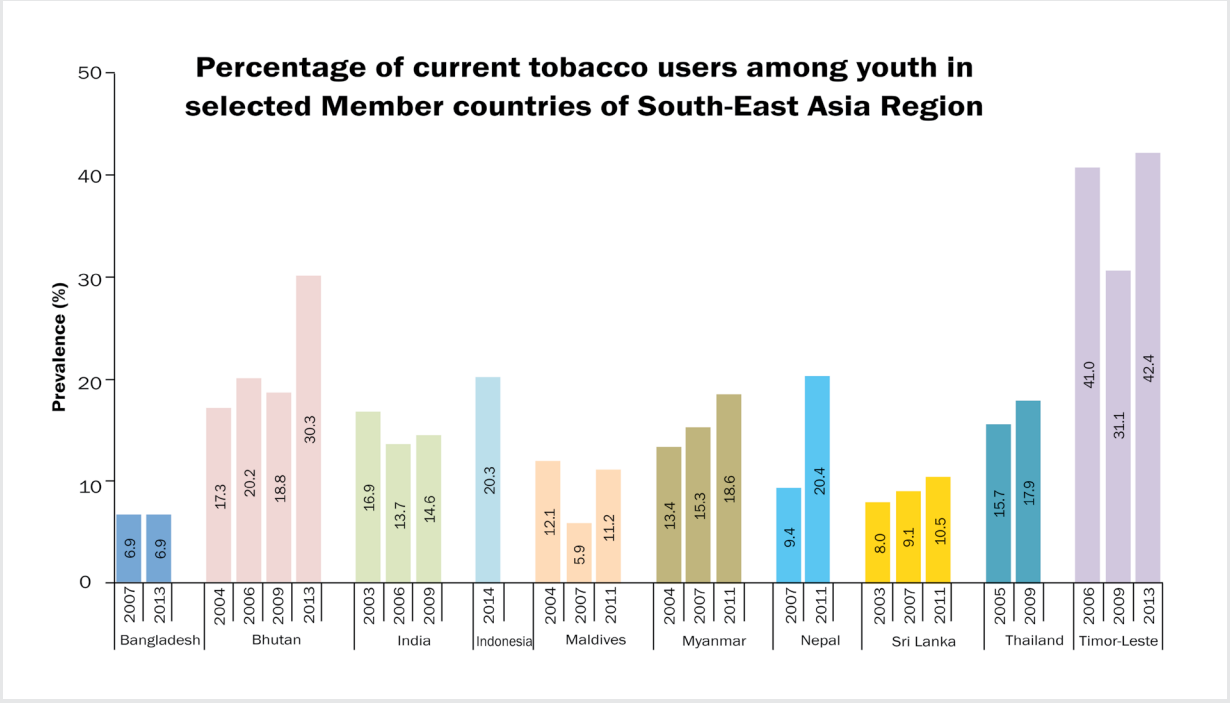


Prevalence of different forms of tobacco use in selected countries of the SEAR.

Source: Palipudi K et al. Indian J Cancer *2014;51:24-32.*

Current tobacco use ranged from 27.2% in Thailand to 43.3% in Bangladesh. Exclusive smoking was more common in Indonesia (34.0%) and Thailand (23.4%) and less common in Bangladesh (16.1%) and India (8.7%). Exclusive SLT use was more common in Bangladesh (20.3%) and India (20.6%) and less common in Indonesia (0.9%) and Thailand (3.5%). Dual use of smoking and SLT was found in Bangladesh (6.8%) and India (5.3%), but was negligible in Indonesia (0.8) and Thailand (0.4%).

Box 2. Cross country comparison using GYTS data

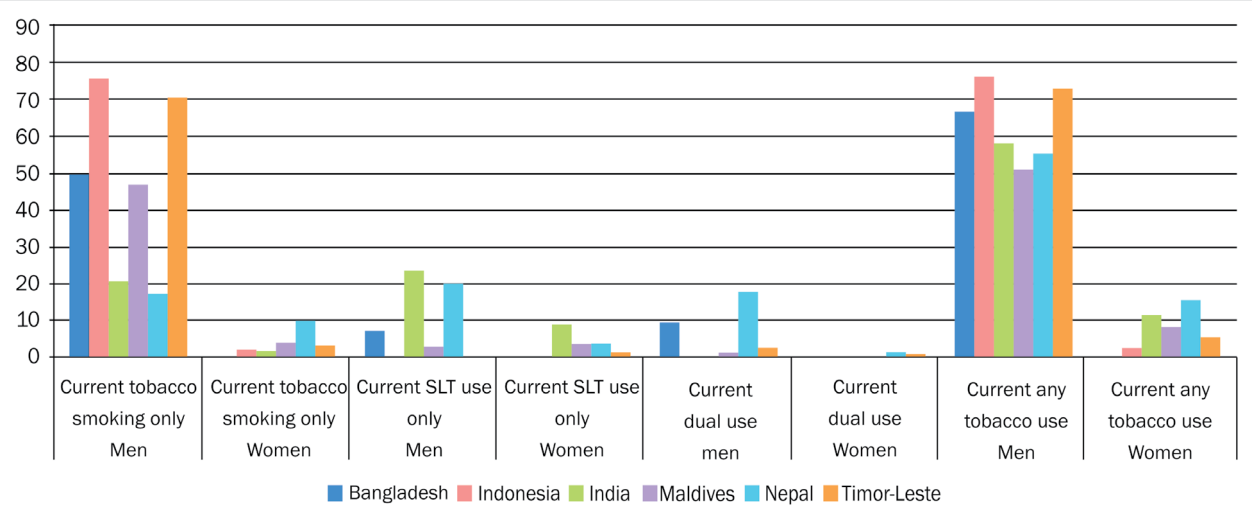


Prevalence of current tobacco use among youth in countries of the SEAR.

Source: Global Youth Tobacco Survey, 2003-2014

Tobacco use varies between 6.9% in Bangladesh (2013) and 42.4% in Timor-Leste (2013). Prevalence of tobacco use has not reduced among 13-15 year olds in any county of the region. However, it has remarkably increased in Bhutan, Myanmar and Nepal.

Box 3. Cross country comparison using DHS data

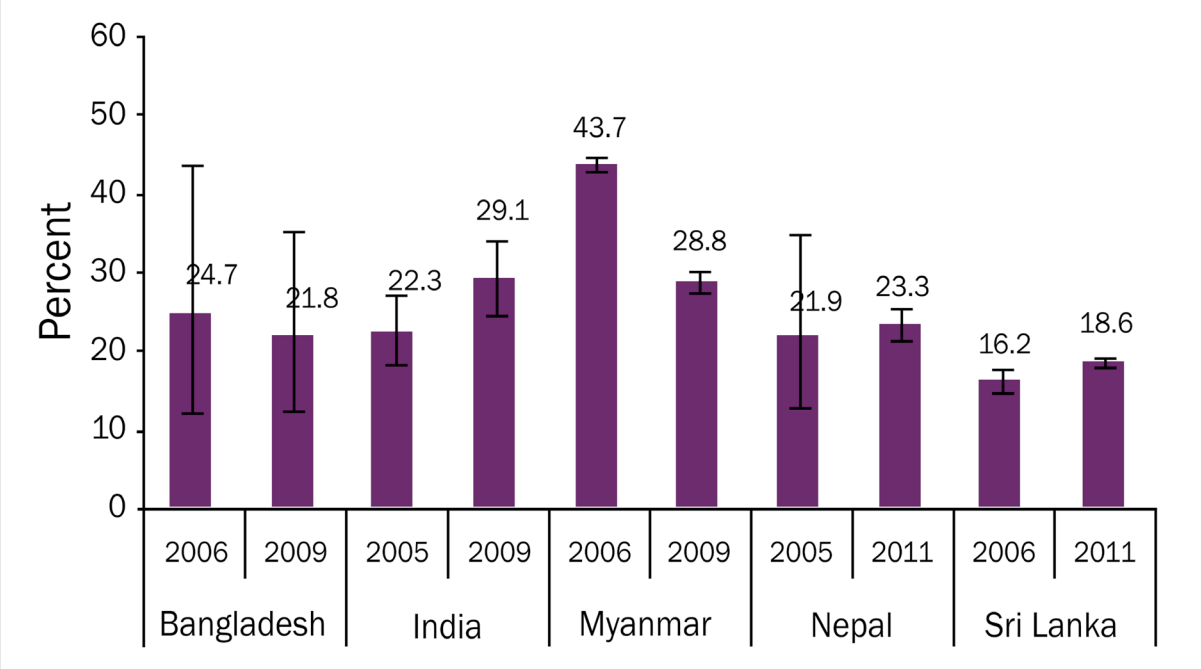


Prevalence of different forms of tobacco use in selected countries of the SEAR.

Source: Sinha N et al. Indian J Cancer 2015 (in press)

Indonesia had the highest prevalence of tobacco smoking (75.9%) and any tobacco use (76.4%) among men. Nepal had the highest prevalence of tobacco smoking (10.2%) and any tobacco use (15.7%) among women and also dual use in both genders (17.9% in men and 1.5% in women). India had the highest prevalence of SLT use in both genders (23.7% in men and 9.4% in women).

Box 4. Cross country comparison using GHPSS data



Percentage of third-year medical students who reported ever-received formal training in smoking cessation approaches in selected countries of the SEAR.

Source: Sinha DN et al. Indian J Cancer *2012;49:379-86.*

There was no significant change in the proportion of medical students ever having-received cessation training in Bangladesh, India, and Nepal between 2005 and 2006 and 2009 and 2011. However, cessation training declined significantly in Myanmar (43.7% in 2006 to 28.8% in 2009), whereas, it increased in Sri Lanka (16.2% in 2006 to 18.6% in 2011).

over time, especially the ones that are conducted at the regional level, limiting the trend analysis. This requires relentless support from the funding agencies that keep tobacco control on the top in their priority list.[20,73]

3.4 Recommendations for future surveys

To complement each other, the researchers should use a comparable methodology with similar populations and spatially spread their surveys to enable trend analysis, try to identify knowledge gaps in tobacco epidemiology in their country instead of collecting redundant information.[74] Some newer areas that could be explored include, urinary cotinine surveys to validate questionnaire-based estimates[75]; qualitative surveys of policy makers and determine the intricate relationship between legal, economical and social aspects of tobacco use[76,77]; explore the perspectives of small scale tobacco farmers throughout the country and their readiness to participate in alternate plantation programmes.[78–80] Countries should make available datasets of country specific surveys freely accessible .[81-84]

Summary

A number of tobacco related data sources collected through different types of surveys are available at the national and subnational level in the WHO-SEAR countries. There is a need to understand their relevance and usefulness for tobacco control activities. The major data sources identified were the Global Tobacco Surveillance System (GTSS), WHO-STEPS surveys, Demographic and Health Surveys (DHS) and country specific surveys. GTSS was the most detailed tobacco survey specifically designed for this purpose and its Global Adult Tobacco Survey (GATS) component was implemented countrywide. WHO-STEPS survey includes a tobacco component within its wider gamut of NCD risk factors. The STEPS survey was usually subnational in implementation. Country level DHS did not always include tobacco

related questions because their primary objectives were maternal and child health. Other surveys that provided data were the World Health Surveys and International Tobacco Control (ITC) study. Country specific surveys also provided an important source of tobacco data spanning several years. The surveys used variable measuring instruments, which limited their usefulness in terms of cross-country comparison and trend analysis. A common set of tobacco related questions such as the Tobacco Questions for Surveys (TQS) could be adopted to alleviate this limitation. Each survey had its own limitations and strengths and they could potentially complement each other. There is a also a dire need to have a common set of adaptable questions covering major domains on tobacco control integrated within country's major surveys so that tobacco surveillance can be integrated with existing mainstream health surveillance systems.

Unit Review Questions

1. Which data sources are most useful to monitor a country's compliance to FCTC rules?
2. What is the main disadvantage of country specific surveys?
3. Comment on the comparability of surveys from different countries as well as within a country.

Assignment

1. Download the NFHS 3 dataset for India from DHS website.
2. Perform a descriptive analysis and compare the prevalence of tobacco use obtained by you with the figures published in NFHS 3 report.

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Suggested readings

1. GATS reports
2. GYTS reports
3. DHS reports
4. Tobacco Questions for Surveys (TQS)

CHAPTER 9

SECOND-HAND TOBACCO SMOKE: CHALLENGE, MONITORING AND EXPOSURE ASSESSMENT

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Describe the Environmental Tobacco Smoke (ETS)
2. Differentiate between side-stream and main-stream smoke
3. Know the chemical composition of SHS
4. Understand how to monitor air quality to measure SHS
5. Measure the exposure of SHS and understand related definition

KEY TERMS

Biomarkers, cigarette equivalents, environmental tobacco smoke, e-cigarette, main-stream smoke, monitoring of tobacco smoke,

1. Introduction

Second-hand tobacco smoke (SHS) originates when a person burn or smoke tobacco products e.g. cigarette, bidis or water pipes. Smoking generates air particles and vapours, which can fill an enclosed space such as bedroom, office or restaurant. Tobacco smoke generated by a smoker in the air, is normally termed as secondhand smoke and can be inhaled by a non smoker or person surrounding the smoker. Exposure to secondhand smoke is known as passive smoking. SHS is also referred to as Environmental Tobacco Smoke (ETS), Passive Smoking or Involuntary Smoking.

People are also exposed to secondhand smoke in public places such as park, bus station and offices. Hecht estimated that about 1 billion men and 250 million women in the world smoke tobacco products[1] He also observed that the prevalence of smokers is higher in Europe and in some parts of Asia.

SHS is a complex and dynamic chemical mixture. The amount of smoke created by a tobacco product depends on the amount of tobacco and other chemical compounds available for burning. The amount of second hand smoke emission by smoking one large cigar is similar to that emitted by smoking a pack of cigarettes.

In general, SHS is the combination of :

- **"side-stream"** smoke (the smoke given off by a burning tobacco product)
- **"main-stream"** smoke (the smoke exhaled by a smoker).

It has also been observed that side stream smoke contains all components of smoke as compared to main smoke. According to Hecht et al., side-stream smoke depends upon various factors like distance from cigarette and ventilation, but it contains detectable levels of some metabolites like nitrosamine 4-(methylnitrosamine)- l-(3-pyridil)- l-butanone (NNK). [2] Crawford et al. also observed that if the mother smokes, their young children have detectable levels of poly-aromatic hydrocarbons-albumin adducts in the blood.[3]

The chemical difference between main-stream smoke and side-stream smoke may arise due to difference in the variation in temperature, pH and degree of dilution with air.[4] The burning end of a cigarette is normally hot enough for the complete combustion of the tobacco. However, incomplete combustion of other constituents of a cigarette generate several other chemicals. Hence, undiluted side-stream smoke contains higher concentrations of toxic chemicals than the mainstream smoke inhaled by the smoker. Some examples of these include 2-naphthylamine, N-nitrosodimethylamine, 4-aminobiphenyl and carbon monoxide.[5]

SHS could be more harmful than a diesel engine exhaust. Italian National Cancer Institute conducted an experiment by burning 3 cigarettes one after another in a 60 m^3 garage with limited air exchange. After burning, the resulting emissions of cigarette smoke and diesel exhaust were compared. Surprisingly, cigarette smoldering produced 10 times more particulate emission and also exceeded the outdoor air pollution standards.

Nicotine is used as a tracer chemical for SHS measurement due to its stability and readily available analytical methods. However, Nicotine from particulate phase can re-enter to gas phase but still nicotine is considered most preferred tracer for the measurement of environmental smoke.

2. Composition of Second-Hand Smoke

SHS or Tobacco smoke consists of solid particles and gases emitted from a burning cigarette, cigar or pipe-smoke. More than 7,000 different chemicals have been identified in tobacco smoke. Out of this, about 70 chemicals are known to cause cancer in both animals and humans. Further out of 70 chemicals, 20 chemicals cause lung cancer. Interestingly, nicotine, a major component found in cigarette is not carcinogen but in particulate phase it contains mixture of many carcinogens along with it[1]. Nicotine is well known for the addiction of tobacco according to this study.

The airborne particles make up about 10% of tobacco smoke and include “tar” and nicotine. The gases or vapours phase composition of SHS make up about 90% of tobacco smoke. The major vapour phase constituent is carbon monoxide, whereas others include formaldehyde, acrolein, ammonia, nitrogen oxides, pyridine, hydrogen cyanide, vinyl chloride, metallic elements (e.g. cadmium, chromium and nickel), Ethylene oxide, Polonium-210 (a radioactive chemical element), N-nitrosodimethylamine, and acrylonitrile. Out of these chemicals, formaldehyde and vinyl chloride are suspected carcinogens in humans. N-nitrosodimethylamine and acrylonitrile have been shown to cause cancer in animals. Tobacco Specific Nitrosaamines exposure results in elevated rates of oral cancer and it is much more with smokeless tobacco than other products.[6]

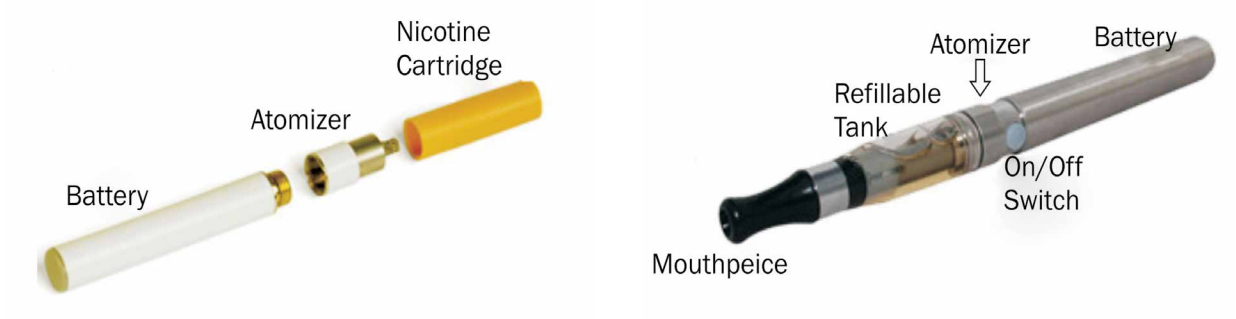
US Government has approved around 600 additives which can be used to make cigarette. However, there might be other products which are used by tobacco companies. There are several factors such as type of tobacco, added chemicals, smoking behaviour and the material in which tobacco is wrapped, which determine the chemicals composition of secondhand smoke.

According to a report, majority of chemicals added to tobacco are not very toxic.[7] However, these chemicals are mixed to enhance the flavour or to influence the pH of the tobacco. The change in the pH influences the absorption of certain compounds such as nicotine.

3. Burden of SHS and Preventive Policies

SHS affects our health similar to the main-stream smoke and hence causes cardio-vascular, respiratory, cancer and other diseases. Further International Agency for Research on Cancer reported that the relative risk associated with exposure to SHS is 1:3 odd ratios for lung cancer in non smokers.[9] Exposure to SHS also causes mouth, throat, stomach, liver, bladder and pancreatic cancer. Heart diseases are very common in active smokers and the risk increases 20-30% more in non-smokers.[9] SHS destructs blood

E-cigarettes



Cartridge Style E-Cigarette **Refillable Style E-Cigarette**

Figure 1: Various type of E-cigarette and their components

Electronic cigarettes (e-cig or e-cigarettes) typically contain battery operated heating element that atomizes liquid solution known as e-liquid into vapours. Normally, E-cigarette has three major components i.e. rechargeable battery, vaporization & a cartridge.[8] E-liquid (smoke juice) contains flavoured chemicals such as propylene glycol, glycerol, nicotine etc. which are inhaled by the user. E-cigarettes are generally cylindrical and hence look like normal cigarettes, cigar or pipes. The benefits and health risk of e-cig are yet not clear. However, the trend of using e-cigarette is increasing in youth and they are available in various designs as shown in Figure 1.

vessels and heart lining tissue etc. Gajalakshmi et al. also reported that 40% of TB patients die due to tobacco use in India.[10] SHS also affects development of unborn baby. The infants and children are at high risk of developing asthma and other allergies. Other problems like headache, eye irritation, nasal discomfort, cough, sneezing, sore throats etc were also reported.[4]

Tobacco exposure causes more than 6 million deaths per year in whole world which is more than 1% of all deaths.[12] The toll is expected to reach 8 million by 2030.[11] However these deaths are preventable. Hence, it is required to create tobacco smoke free environment. The Adult Tobacco Survey (ATS) is an efficient way to collect baseline data and monitor tobacco prevalence in country. In 2003, India enacted a comprehensive national law COTPA (Cigarettes and Other Tobacco Products Act) under the aegis of FCTC (Framework Convention of Tobacco Control) by WHO.[13] Under the act, smoking is prohibited at all public places including indoor places under Section-4 of COTPA since May 2004.[14] It also bans sale of tobacco products to minors, restrict sale of tobacco products near educational institutes and curbed advertisement of tobacco products (direct or indirect). Sustainable efforts are required for the compliance of tobacco smoke free law, which is only possible with the partnership of local administration and involvement of all stakeholders.

GATS (Global Adult Tobacco Survey) is a standard for monitoring and assessment of tobacco use in any form globally. India is the second largest consumer of tobacco in the world. According to GATS India report, 34.6% adults (47.9% males and 20.3% females) use tobacco in any form in India.[15] Out of these 34.6%, 14% adults use tobacco in the form of cigarettes and bidis. 25.9% adults are exposed to SHS. If we count by number, 274.9 million people are tobacco users; 68.9 million people are active smokers, 163.7 million are exposed to SHS and 42.3 million are exposed by both active and passive form. According to the report, 52.3% people are exposed to SHS at home and 29% at public places.[15] The proportion of people exposed to SHS was found to be more in rural areas as compared to urban areas whereas cigarette smoking was found more in urban areas. SHS exposure was found in 58% people in rural and 38.5% in urban areas. The prevalence of tobacco was found more in males (24%) as compared to females (3%). Tobacco use was highest in Mizoram (67%) and lowest in Goa (9%). The exposure to SHS was highest in Jammu and Kashmir (68%) and lowest in Chandigarh (15%). Based on the GATS findings, region specific tobacco control programmes are required to curb the tobacco uses and SHS exposure.

Table 1: Percentage of Adults aged 15 & above using tobacco[15]

Status of tobacco use	Overall	Gender		Residence	
		Male	Female	Urban	Rural
Current users	34.6	47.9	20.3	25.3	38.4
Daily user	29.1	40.8	16.7	21.1	32.5
Occasional	5.4	7.1	16.7	4.2	5.9
Current non-users	65.4	52.2	79.7	74.7	61.6

Table 2: Percentage of persons aged 15 & above exposed to SHS at work and home[15]

Characteristic	Adults exposed to SHS at work		Adults exposed to SHS at home	
	Overall	Non smoker	Overall	Non smoker
Overall	29.9	26.1	52.3	48.0
Male	32.2	28.1	52.2	43.9
Females	19.4	18.9	52.5	51.3
Urban	27.6	24.3	38.5	34.5
Rural	32.1	27.8	58.0	53.7

4. Monitoring and SHS Exposure assessment

Monitoring and exposure assessment of SHS in real environment is really difficult as the concentration and the exposure may differ based on the type of cigarettes or other tobacco products burned, the number of cigarettes consumed, number of smokers, the rate and behaviour pattern of smoking, the room volume and ventilation rate and finally the inflow of fresh air into the room.

In general, four main approaches can be used to measure the exposure to tobacco smoke. These include:

- Monitoring of air quality: Personal and indoor
- Exposure Modelling
- Exposure assessment using a questionnaire
- Monitoring of biological markers

4.1 Monitoring of air quality: Personal and indoor

There is large number of smokers in our society which makes SHS as a major source of air contamination. Target chemicals from smoke can be captured using personal and micro environmental monitoring instruments. In general, a person spends its day in various environments like home, workplace, restaurant, public places, outdoors etc.

Air quality samplers, which can be used to measure tobacco smoke, are classified as:

- Personal monitors or samplers
- Stationary monitors or samplers

Personal monitors are very useful to estimate individual exposure as a person spent his or her time in various micro environments. These samplers are small and light weight and can be easily worn by an individual and capture the particulate samples or the target compound from smoke emissions. Normally, these monitors are worn near nose or in the breathing zone. Cigarettes, cigars and pipes are major source of respirable suspended particulate matter i.e. particles less than PM_{10} or $PM_{2.5}$ that can be easily inhaled by a person.

Stationary monitors can also be used to monitor aerosols or gaseous pollutants. Stationary samplers remain fixed at a location and hence, collect sample only for a specific site. Particulate matter or aerosol

Cigarette Smoke Detector

Figure 2: Sketch of cigarette smoke detector

There are various smoke detectors or alarms available in the market. These can work alone and can be equipped with other devices like wireless networks also. They provide many options and we can customize them according to our convenience. There is range of detectors from cigarette lightning to flame detectors. These can cover building of any size and play significant role in notifying us of second hand smoke. These may be battery driven or by plugging-in. Polymer films pair inside the device senses the smoke nearby and alarms people. Basically these detectors used to work on the basis of smoke but now-a-days these are available for e-cigarettes as well.

samples are normally collected on a quartz or glass fibre filter papers. Filter paper are placed inside the samplers and particulate concentration is calculated based gravimetric methods taking into account the volume of air passed through the filter and weight difference. The chemical constituent of aerosol particle is normally analysed in the laboratory using standard analytical technique such as HPLC, GC-MS, AAS or ICP-MS.

Carbon mono-oxide (CO) is a by product of incomplete combustion. The variation in CO concentration could also be used to differentiate between tobacco and non tobacco smoke. However, data needs to be analysed carefully as other sources (e.g. vehicular pollutants) may influence the CO levels.

The primary source of **polycyclic aromatic hydrocarbons (PAHs)** is incomplete combustion of any product including cigarette smoking.[16] PAHs generally occur as complex mixtures like soot or SHS but not as single compounds.[17] Side-stream smoke contains PAHs and other chemical substances higher than those found in the main-stream.

Tobacco-specific nitrosamines (TSNAs) are potential carcinogens specific to tobacco. TSNAs are also found in smokeless tobacco products. The alkaloid derived metabolites of TSNAs such as 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol and N'-nitrosonor nicotine has been used as biomarker for tobacco smoking.

Other chemical compounds such as heavy metals, nitrogen oxides, aldehydes and volatile organic compounds (VOCs) also have potential to be used as indicators of SHS. However, these chemicals are non-specific to tobacco and hence it is better to use them in association with other compounds as indicators chemicals of tobacco smoke.

4.2 Exposure Modelling

Average amount of environment tobacco smoke exposure can be estimated by the mass balance equation given in the report by Surgeon General in 2006 which is given by sum of product of concentration and time divided by total time.[19]

Nicotine and its derivatives

Nicotine is monitored using air samplers or in biological samples (blood, saliva, urine). However, 3-Ethenylpyridine (3-EP) could also be measured as it is formed due to decomposition of nicotine and considered more stable compound.

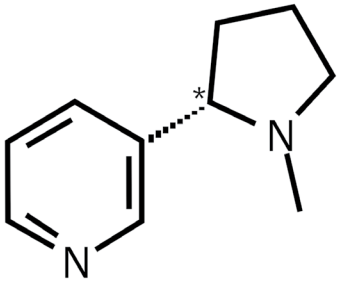


Figure 3: Chemical structure of Nicotine

3-Ethenylpyridine (3-EP): The level of 3-EP increases during smoking of cigarettes or other tobacco products. 3-EP is analysed using GC-MS technique. Hence, it also offers as an alternative marker of SHS.[18]

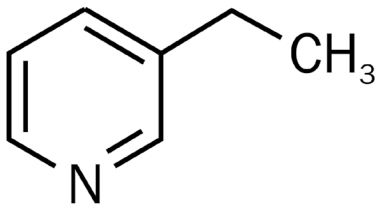


Figure 4: Chemical structure of 3-Ethylenepyridine

$$\sum i = \sum_{i} Cij\ Tij$$

Where,

Cj is the concentration of contaminant in microenvironment j;

Tij is the aggregate time that person i spends in microenvironment j;

4.3 Standard Questionnaires and survey

Questionnaires can also be used to estimate the potential exposure to tobacco smoke. Participants are asked to recall locations, where they were exposed to secondhand smoke over a given period of time. Further, this requires categorization of smokers, number of cigarettes smoked to estimate the amount of tobacco smoke present in the air.

4.4 Biomarkers

Exposure to SHS can be estimated using biomarkers. When individuals are exposed to tobacco smoke, they carry the signature of certain chemicals. These chemicals can be measured in saliva, blood or urine (e.g. cotinine, nicotine).

Cotinine as biomarker of smoking: Cotinine is a metabolite of nicotine. It can also be used as a biomarker of SHS exposure. The level of cotinine is generally measured in the blood and urine. The cotinine accumulates in the hair and hence analysis of human hair also offers as a non-invasive measurement technique for the exposure of tobacco smoke. The nicotine absorbed by the body is rapidly metabolized to cotinine. Cotinine is a stable product which has residence time of around 30 hours in the blood and subsequently reaches to urine. Urine cotinine levels reflect tobacco smoke exposure over the period of last 48 hours. Cotinine concentrations in hair and nails can indicate tobacco exposure even over the period of last three months.

5. Chemical carcinogen in cigarette

International Agency for Research on Cancer (IARC) defines carcinogen as an agent which increases the risk of cancer in human. As per the IARC classification, carcinogens are divided into following categories (Refer to Table 3).[20]

6. SHS: Exposure equivalents

Exposure equivalents help us to assess the comparative exposure of two smoke emitting devices by considering emissions of a standard chemical e.g. CO, PM2.5, Nicotine etc. For example, it can tell us that if someone exposed to SHS, comparatively to active smoker how much amount of the target compound / contaminants (e.g. carbon monoxide, smoke particles nicotine and hydrogen cyanide) will be breathe in by the non-smokers.

7. SHS: Risk level

Scientific evidences suggest that there is no minimum level of exposure to second hand smoke. Even the exposure to traces of secondhand smoke can potentially affect the human health. Hence, to prevent health effect of smoking, secondhand smoke

Table 3: List of selected carcinogenic chemicals found in cigarette smoke

Group	Toxic level	Chemicals in cigarette smoke
1	Carcinogenic to humans.	Total 116 (e.g. Arsenic, Benzene, Cadmium, Formaldehyde, Nickel)
2A	Probably carcinogenic to humans.	Total 73 e.g. Lead
2B	Possibly carcinogenic to humans.	Total 287 e.g. Acetaldehyde, Acrylonitrile, Isoprene, Styrene
3	Not classifiable as to its carcinogenicity to humans.	Total 503
4	Probably not carcinogenic to humans.	1

Cigarette Equivalents
SHS exposure can be measured as ”cigarette equivalents”. Cigarette equivalents (CE) can relate the magnitude of a non-smoker’s SHS exposure to the magnitude of main stream smoke inhaled by a smoker. CE can be measured by comparing the concentration of certain chemicals emitted during smoking (e.g. Nicotine, PM2.5, CO, tar etc) in a mainstream smoker to the non smoker. E.g. the amount of secondhand smoke emission by smoking one large cigar is similar to that emitted by smoking a pack of cigarettes.

Table 4: Relative risk of selected chemicals found in tobacco smoke

Chemical	Relative risk	IARC classification
NNK	0.04%	2B
NNN	10.7%	2B
1,3-Butadiene	100%	2A
Chlorinated dioxins	3%	1
Nickel	0.004%	1
Lead	0.0001%	2B
Cadmium	1.7%	1

should be eliminated completely specially in indoor environment. To reduce the exposure to second hand smoke, smoking in indoor environment should be restricted or should be allowed only in enclosed chamber with adequate ventilation.

The relative risk>1 is normally observed for non-smokers when they are exposed to SHS. This helps to build relationship between targeted disease & exposure to tobacco smoke. In epidemiology, relative risk >3.0 indicates a very positive association (defined as cause).

Summary

Environmental tobacco smoke is originated from burning tobacco in the form of cigarette, cigar or pipe. It mainly comprises of side-stream smoke rather than main-stream. About 73 chemicals out of more than 4000 known chemicals are carcinogenic which is much higher. Hence, focus should be to avoid exposure the secondhand tobacco smoke. Concentration and exposure to SHS can be assessed using various methods (e.g. air quality monitoring, biological markers, modelling, questionnaires). When a tobacco product is burned, it emits several chemicals, which in turn decomposes or metabolizes to more harmful chemicals. Hence, the uses of tobacco cigarette, cigar or pipe should be restricted and further smoking should not be allowed even in enclosed chamber with adequate ventilation as no architectural or engineering measures can completely eliminate SHS.

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Unit Review Questions

1. What is second-hand smoke and define the smoke type?
2. List the key factor which leads to chemical difference in main-stream smoke and side-stream smoke?
3. What are the major components of second-hand smoke and list key carcinogenic compounds found in it?
4. What are the approaches to measure the exposure to tobacco smoke?
5. Differentiate between personal monitor and stationary monitors?
6. Write a short note on nicotine and its derivatives?
7. What is cigarette equivalent?
8. What are the major components of E-cigarette and list the chemicals used in smoke juice?
9. List they key point form a classroom discussion on the benefits and health issues associated with E-cigarette?
10. Discuss the benefits and limitations of personal and stationary monitors?

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CHAPTER 10

YOUTH AND TOBACCO USE

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Understand india's burden of the tobacco epidemic among adolescents.
2. Familiarize with the various forms of tobacco, including new products which target youth.
3. Understand prevalence and trends of tobacco use among adolescents and related determinants.
4. List and explain key psychosocial risk factors that influence tobacco use among adolescents.
5. Understand tobacco Industry tactics to target youth.
6. List essential components of successful tobacco use prevention and control programmes for adolescents.

KEYWORDS

Advertising, determinants, pictorial health warnings, tobacco, tobacco industry tactics, youth

1. Tobacco Burden among Adolescents

Tobacco is the single largest preventable cause of death and disease in the world today.(1) About 6 million people die every year due to tobacco-related diseases(2). By 2030, this number will rise to approximately 8.3 million annual deaths(3) with over half in people aged between 30-69 years(4) robbing productive years of life and exposing dependent family members to the risk of poverty. There are approximately 1.3 billion smokers world-wide, with around 82% residing in low-and middle-income (LMICs).(5)

Tobacco use by youth/adolescents is a growing major public health concern worldwide and has been referred to as a "pediatric disease" or "pediatric epidemic".(6) It was predicted that if the current tobacco use pattern continues, a lifetime of tobacco use would result in the deaths of about 250 million children and young people alive today, most of them in developing countries.(7)

Most tobacco users begin before the age of 18 years and are at the risk of losing the most productive years of their lives. Because of the addictive power of nicotine, about three out of four teen smokers end up smoking into adulthood, abstinence in the beginning, therefore, is a much easier task than quitting later.(6)

There is a causal relationship between tobacco and addiction to nicotine, which begins in adolescence and young adulthood. Active smoking leads to both reduced lung function and impaired lung

growth during childhood and adolescence. It also is a causative factor for wheezing severe enough to be diagnosed as asthma in susceptible child and adolescent populations. Smoking in adolescence has also been shown to be associated with early abdominal aortic atherosclerosis in adolescents.[6] An evolving epidemic of oral sub mucous fibrosis has been seen among youth, attributable to Gutkha use, resulting in an increase in oral cancer presentations in younger age groups.[8]

2. Types of Tobacco Products

Unlike other countries where smoking is the prevalent form of tobacco use, India is unique with tobacco being used in a number of ways. Myriad varieties of smoking and smokeless tobacco products available make tobacco a versatile product for consumption among adolescents. These varieties add to easy access, availability and affordability of tobacco products for children and adolescents.[9] Table1 lists the different forms of tobacco products.

Hookah smoking is becoming increasingly popular-particularly among young people.[10, 11] Many are under the false impression that shisha is a safer alternative to cigarettes. Hookah/Shisha also has been associated with a variety of adverse health outcomes, including esophageal cancer, decreased pulmonary function, infertility, infectious diseases and physiological dependence.[12, 13]

Electronic cigarettes contain carcinogens and toxic chemicals such as diethylene glycol, an ingredient used in antifreeze. These are marketed in youth-friendly candy and fruit flavors including bubble gum, cookies, cream.[14] One in three students perceived e-cigarettes as less harmful than conventional cigarettes.[15]

3.Tobacco Use Prevalence among Adolescents

3.1 Global Prevalence

Adolescence is the most susceptible age for tobacco initiation. Worldwide, between 82,000 to 99,000 young people start smoking every day. In LMIC's, 68,000 to 84,000 young people take up smoking every day[16] 9.5% of adolescents in the age group of 13-15 years currently use cigarettes. Of these, nearly a quarter reported trying their first cigarette before the age of 10 years. Among who had never smoked cigarettes, 19.1% were susceptible towards initiating smoking during the next year.[17] Research has shown that initiation at an early age increases dependency and makes quitting harder as an adult.[18] Figure 1 shows that among the most populous nations for which comparable estimates are available; among boys, India ranks the highest in prevalence of smokeless tobacco use (11.1%), followed by Bangladesh (5.8%), United States of America (USA) (4.1%) and Indonesia (3.3%). India ranks the highest (6%) followed by

New Tobacco Products Gaining Popularity among Youth

The tobacco industry is using the same flavors found in popular candy and drink products to lure kids to use candy-flavored tobacco products. Flavored cigarettes are a gateway for many children/young adults to become regular smokers as almost 90% of adult smokers start smoking as teenagers. It has been noted that flavored smoking products are used by 42% of middle-school and high-school students who smoke.[12, 13]

Table 1: Types of Tobacco Products Used in India

Smoking forms	Smokeless forms	Vapor/Electronic
Cigarettes, Bidi, Cigars, Cheroots, Chuttas, Dhumti, Hookli, Chilum, Water pipe, Hookah.	Tobacco for oral use: Pan (Betel quid) with tobacco, Pan masala with tobacco, Manipuri tobacco, Mawa, Khaini,Zarda, Tobacco water (known as Tuibur in Mizoram), Snus (sucking form) Mishri, Gul, Bajjar, Lal dant manjan,Gudhaku. Tobacco for nasal use: Tapkeer or bajjar, Snuff.	Electronic Nicotine Delivery Systems (ENDS)/E-cigarettes/ E-hookahs

(Adapted from: Reddy and Gupta, 2004)

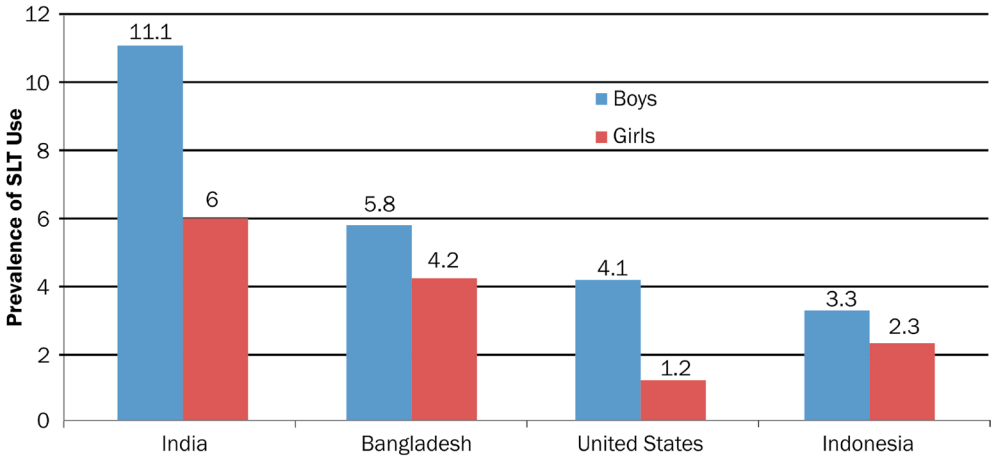

Figure 1: Smokeless Tobacco (SLT) Use among Youth (13-15 yrs)

(Source: IARC Monograph 2009)

Bangladesh (4.2%), Indonesia (2.3%) and USA(1.2%) for the SLT use among girls.[19]

3.2 Tobacco Use in LMICs

In LMICs, most of the smokers start smoking by early twenties but the trend is towards initiation at younger ages. This decline in age of initiation is similar to that observed in the high income countries.[16] Data from Global School Health Survey (GSHS) conducted in 44 countries with school going adolescents (aged 13-15 years) between 2003-2007 showed that the total current smoking prevalence ranged from a low of 0.9% in Tajikistan to a high of 32.8% in Chile metro region. In South-East Asia (SEA), current smoking prevalence ranged from a low of 1.2% in India to a high of 11.7% in Indonesia.[20]

3.3 Indian Prevalence

In India, there is evidence of decrease in age of initiation of tobacco products use.[21] Tobacco use starts as early as six years of age in low SES communities in India.[22] GYTS conducted in 2009 among school students aged 13-15 years suggests that 14.6% (Boys = 19%, Girls = 8.3%) currently use any tobacco product, 4.4% (Boys = 5.8%, Girls = 2.4%) currently smoke cigarettes, 12.5% (Boys = 16.2%, Girls = 7.2%) currently use tobacco products other than cigarettes.[23] Exposure to Second Hand Smoke (SHS) is moderate, 1 in 5 students lives in homes where others smoke, and has decreased a little since 2006. Table 2 shows the trends of tobacco use in youth aged 13-15 years taken from the GYTS 2000-04, 2006 and 2009. Several studies have shown high prevalence of tobacco use among medical students. The Global Health Professional Student Survey (GHPSS) conducted in 15 medical colleges of India showed life-time use of cigarettes and other tobacco products to be 28.2% and 22% respectively.[24]

About 60% of tobacco users in India initiate tobacco use before reaching the age of 20 years. The mean age at initiation of daily tobacco use is 17.8 years. GATS India also highlighted that females and rural tobacco users started tobacco use at a younger age than their male and urban counterparts respectively. While 26% of female tobacco users started daily tobacco use by the age of 15, the corresponding figures for males is only 13%.The pattern of age at initiation of tobacco use varies across the regions and states/UTs, with tobacco use being initiated at a much younger age in the Central region. The youngest age of initiation is 16.2 years in Chhattisgarh, while the highest is 20.5 years in Himachal Pradesh[25]. Across countries, Manipur, India (87.8%) has the highest rate of smoking initiation before age 10, and the lowest is seen in Buenos Aires, Argentina (6.1%).[26] It is illegal to sell cigarettes or any other tobacco product to a person under the age of eighteen years in India, which is lesser than the legal age of Kuwait and Sri Lanka of 21 years, but higher than that of Austria and Zambia of 16 years of age.[27]

Table 2: Trends in Prevalence of Tobacco Use among Youth (13-15 years) in India

Tobacco use	India 2000-2004	India 2006	India 2009
	Total	Total	Total
Prevalence:	-	12	6.1
Ever smoker cig	17.5	13.7	14.6
Current Use (any)	4.2	3.8	4.4
Current Use (Cig)	13.6	11.9	12.5
Second hand Tobacco Smoke:			
Live in presence of smokers in home	36.4	26.6	21.9
Area around smokers outside homes	48.7	40.3	36.6
Think smoking should be banned in public places	74.8	74	63.9
Have parents who smoke	-	35.2	26.4
Have friends who smoke	-	6.1	9.5
Media and Advertising:			
Saw anti-tobacco advertisements in past 30 days	-	74	77.5
Saw pro-tobacco ads in past 30 days	38-42	71.6	74.4
Was offered free cigarette by a tobacco company representative.	8.1	11.2	8.1

(Source: Global Youth Tobacco Survey (GYTS) 2006& 2009 India.)

4. Health effects of tobacco use

Tobacco is a risk factor that adversely impacts every system of the human body. Box 1 provides an overview of tobacco related morbidity. Figure 2 shows the different diseases caused by tobacco smoking both first hand smoking and second hand smoke exposure.

5. Why focus on adolescents?

Adolescence is a period of immense vulnerability to social influences and the pervasive presence of tobacco marketing-including everything from sleek advertisements in magazines to youth-generated posts on social networking sites. Tobacco imagery in the movies-makes tobacco use attractive to youth and young adults.[6]

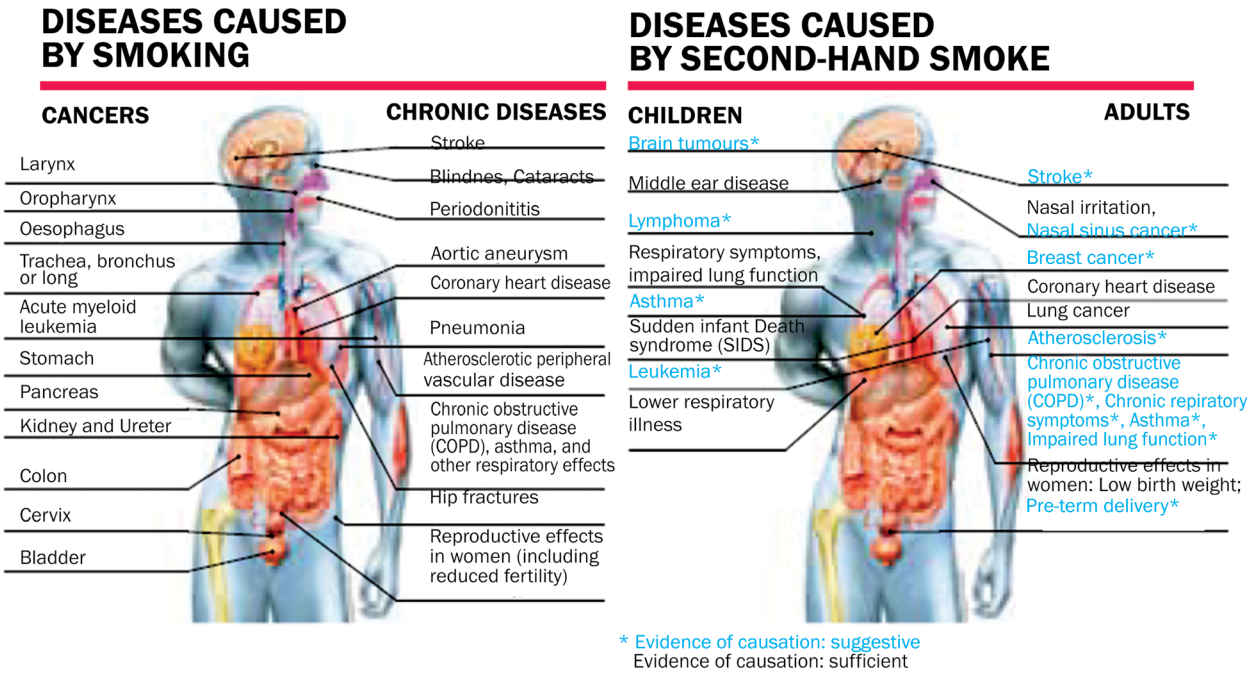

Figure 2: Diseases Caused by Tobacco Smoking- First Hand and Second Hand

(Source: WHO MPOWER,2008)

Box 1: Health Consequences Related to Tobacco Exposure	
A. Cardiovascular diseases	**C. Respiratory diseases**
Early abdominal aortic atherosclerosis	Asthma
Tobacco induced vascular injury	Wheezing
Endothelial dysfunction	Decreases physical fitness
Lipid abnormalities	Potential retardation in the rate of lung growth and the level of maximum lung function among children and adolescents
B. Cancer	**D. Mental Health Problems**
Oral sub mucous fibrosis	Anxiety
	Psychiatric comorbidity
	Attention deficient hyperactive disorder (ADHD)
	(Source: USDHHS, 2012)

Long Term Health Effects of Smoking

Long term tobacco use is associated with respiratory diseases, cancers (mouth cancer, lung cancer and other cancers), cardiovascular disease (3 times higher risk due to smoking) and stroke. On an average, a male smoker suffers a heart attack 7 to 8 years earlier than a male non-smoker. There are reproductive consequences (low sperm count and poorer sperm quality in males, adverse pregnancy outcomes and complications like fetal death in females),a 3 fold increase in risk due to smoking of contracting tuberculosis. Smokeless tobacco use also leads to oro-pharyngeal cancers in youth due to the habit of chewing.[28,29,30,31,32]

Short Term Health Effects of Smoking

Smoking aggravates respiratory illnesses, cause impairments in lung function and leads to reduced rate of lung growth. Tobacco smoking serves as a gateway to other substance and drug abuse. Teens who smoke are three times more likely than non-smokers to use alcohol, eight times more likely to use marijuana, and 22 times more likely to use cocaine.[33] *Tobacco smoking compromises physical fitness and is associated with other risky behaviours such as fighting, engaging in unprotected intercourse and such youths are also low academic achievers.*[34]

Second Hand Smoke

Second Hand Smoke (SHS) or Passive smoke is a mixture of side-stream smoke from the burning tip of the cigarette/bidi and mainstream smoke exhaled by the smoker. Approximately 600,000 deaths are attributable to SHS exposure globally each year. Children are especially vulnerable to SHS- Adverse health effects include: pneumonia, bronchitis, coughing, wheezing, worsening of asthma, middle ear infections, reduced lung growth, neuro-behavioural impairment and cardiovascular diseases. As per WHO estimates, almost half of the world's children breathe air polluted by tobacco smoke. Children of parents who smoke are shown to have a higher 2, 3-diphosphoglycerate (2,3- DPG) levels in blood, as the body compensates for the decreased oxygen carrying capacity of blood due to carbon monoxide binding.[35]

Vapors

E-cigarettes produce an aerosol like vapour. The analysis of these vapours has exposed the presence of many toxic substances. While e- cigarettes do not burn like conventional cigarettes, they do release side stream vapors. The vapours released by e-cigarettes have been shown to have deleterious effects on different systems of the body such as increase in airway resistance and decrease in expired Nitrous Oxide, leading to constriction of the peripheral airways.[36,37,38]

Tobacco companies identify youth as their important target audience and capitalize on the vulnerability of this age group to promote their products more effectively. Tobacco companies spend millions of rupees on such marketing tactics. In a bid to enhance their social profile, tobacco industry sponsors various events like school competitions, bravery awards, and fashion events etc. India has an alarming figure of 5500 adolescents initiating tobacco use every day.[39] In India, tobacco companies also give away free samples of tobacco products in public places such as shopping malls, rock concerts and discos. Distributing free tobacco products costs very little and allows the tobacco industry to attract new users. Data from research among youth in India has revealed tobacco industry tactics that among target youth more than 8% have been offered free cigarettes by a tobacco company representative and more than 74% saw pro-cigarettes ads on billboards, in the past 30 days.[40]

With enforcement, prohibiting advertisements, tobacco industry shifted their focus to advertising through films and television. Films and television are among the tobacco industry's preferred media because of their mass outreach. India is the first country globally, to regulate tobacco imagery in films.

6. Determinants of Tobacco use

Tobacco use is a social and public health problem. It is not restricted to an individual's behaviour but is a multi-faceted process influenced by wide ranging contextual factors i.e social, environmental, psychological, and genetic factors have been associated with tobacco use. Considering the multi-level influences by wide ranging contextual factors, a comprehensive evidence based model i.e IMPACT (Intervention Model for Protecting Adolescents and Children against Tobacco) was put forth in Figure 3 This framework aimed at addressing multi-level risk factors influencing tobacco use among children and adolescents with multi-level policy and programmatic approaches in India. The framework discusses multiple levels determinants that influence youth to experiment and continue using tobacco on left side and is based on social learning theory. While the layers on the right side represent the policy and program interventions that can be implemented at various levels, using social ecological model.[41]

7. Strategies to protect youth and adolescents from tobacco use – Policies and Programmes

7.1 Policy Level Approaches

Increase Taxation on Tobacco Products as an effective intervention. Evidence shows that increasing the price of tobacco through higher taxation is one of the most effective strategy to encourage tobacco users to quit and as well as to prevent initiation among youth.[42] If tobacco products prices are increased by 10%, the demand for tobacco products would decrease by 4 % – 9 % in India.[43,44] Since 2004, state governments have been raising taxes on tobacco products including gutka and cigarettes but bidis have largely been exempted.[43] Taxes on inexpensive tobacco products should be equivalent to higher-priced products, such as premium-brand cigarettes, to prevent substitution in consumption. Taxes need to be increased regularly to correct for inflation and consumer purchasing power.

7.2 Health Warnings on Tobacco Products

Health warnings on tobacco products are the most effective way of communicating ill effects of tobacco

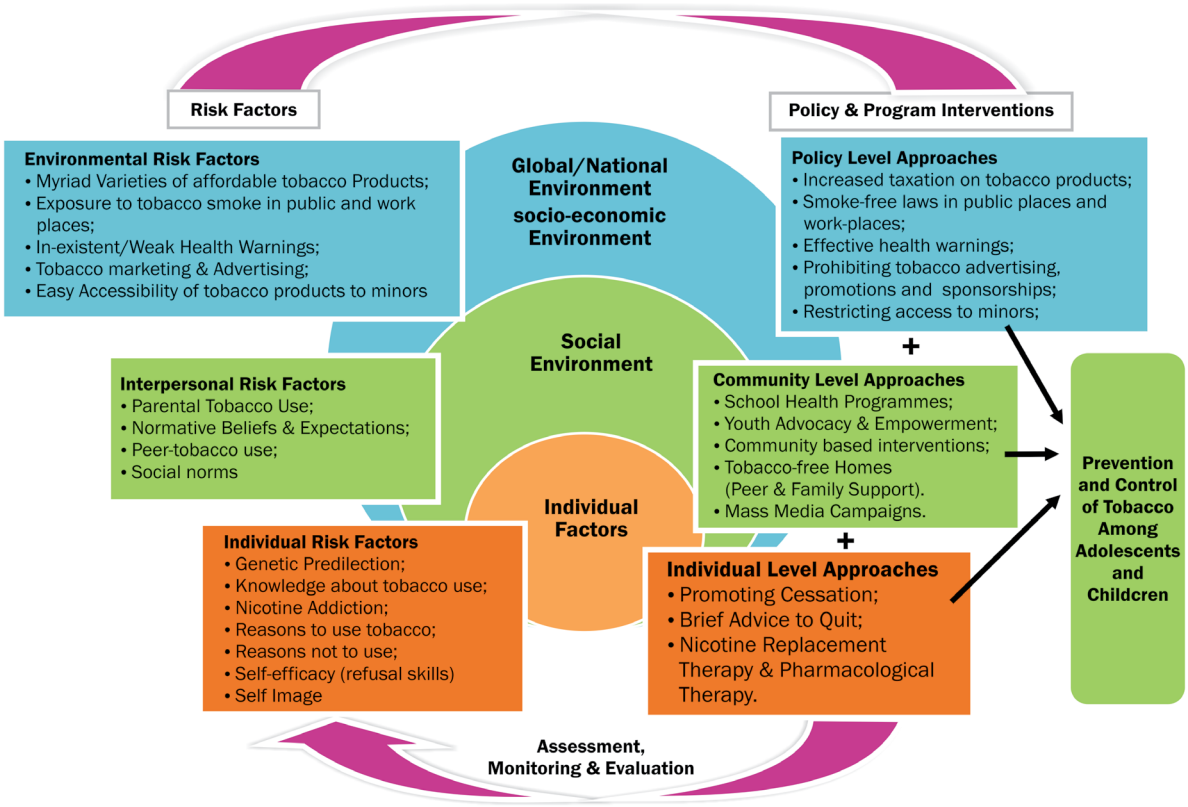

Figure 3: IMPACT(Intervention Model for Protecting Adolescents and Children against Tobacco)

(Source: Arora M, 2012)

use, particularly among those with low literacy levels and youth. Pictorial health warnings (PHWs) communicate health messages effectively and can influence decisions. Larger PHWs on tobacco packaging capture attention, educate effectively about the health hazards and reduce the appeal of pack and smoking. PHWs discourage non-users, particularly youth from starting, encourage current users to stop and prevent relapse of those who have already quit. Research evidences from various countries show that PHWs have reduced tobacco use among consumers and have increased their readiness to quit.[45] One of three current users thought of quitting on seeing the PHWs.[25] India notified its first set of PHWs in 2006, which come into force from 2007 which were enforced from 2009 after considerable delays and dilution.

7.3 Prohibiting Tobacco Advertising, Promotions and Sponsorship (TAPS)

Section 5 of Indian Tobacco Control Law-2003, prohibits all forms of direct and indirect tobacco advertising in India.[27] Article 13 of the WHO Framework Convention on Tobacco Control (WHO FCTC) highlights that a comprehensive ban on all forms of TAPS is the only protection of children and adolescents from advertising and promotions and partial bans are not at all effective.[46] Multiple forms of direct and indirect TAPS are creatively used by the tobacco industry to target and recruit new tobacco users-particularly young people. There is a direct relation between youth exposure to tobacco advertising and consequent youth intake of tobacco products. In India, current tobacco use was five times higher in students who were highly receptive to tobacco advertising than those who were least receptive; tobacco use was also 12% higher in those exposed to tobacco advertisements and current tobacco use was almost twice as high in those students who were exposed to tobacco advertising in more than four places as compared to those who were not exposed to any.[47]

Bivariate results from a study conducted to examine the longitudinal relationship between exposure and receptivity to tobacco advertisements and progression towards tobacco use among adolescents in India reported that exposure to tobacco advertisements at baseline was associated in a dose-dependent manner

with progression at endline. Students exposed at more than four places were 1.5 times (95% CI 1.12 to 1.94; p<0.05) more likely to progress towards tobacco use at endline versus those not exposed.[48]

7.4 Protection from Second Hand Smoke (SHS)

Research suggests that smoking restriction laws also aid in protecting adolescents/children from initiating smoking and promote quit behaviour creating a smoke free environment.[49] The Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003 (COTPA), prohibits smoking at public places in India.[27]

7.5 Restricting Access to Minors

Several measures of India's tobacco control law seek to protect youth from tobacco use and other policy measures have been proposed to strengthen this law. India is the first country to prohibit sale of tobacco products in an area within 100 yards of educational institutions, a measure that transcends the World Health Organization Framework Convention on Tobacco Control (FCTC). It is also mandatory for the school administration to display warning boards at conspicuous places. COTPA also prohibits sale of tobacco products to and by minors.[27] Research has demonstrated that this prevents initiation of tobacco use by adolescents and restricts adults through a decrease in the total tobacco sale outlets.[50]

7.6 Tobacco Endgame-Tobacco Free Future Generations

In 2013, the World Health Assembly (WHA) adopted a target of 30% relative reduction in tobacco use prevalence by 2025. This development shifted the global narrative on tobacco control towards the concept of 'tobacco endgame', which envisions reducing tobacco use prevalence and availability to minimal levels. Countries like New Zealand, Finland and Norway have proposed to become tobacco-free within next three decades and Singapore and Tasmania have proposed to restrict sale of tobacco products to individuals born after the year 2000. Currently countries are developing programmes and plans for tobacco free future generations.

8. Community Level Approaches

8.1 School-Based Health Programmes

Evidence-based tobacco control curriculum implemented in schools to educate youth and enforcing tobacco free policies have shown promising results in India. Multi-component school based intervention programs have been shown to be effective in reducing tobacco use among Indian adolescents.[51]

8.2 Youth Advocacy and Empowerment

Youth engagement has been identified as imperative for developing an effective and comprehensive tobacco control programme. Youth advocacy platforms such as Youth for Health (Y4H) model aiming at formulation of a global alliance for tobacco control and other common youth concerns were reported to be successful strategies for engaging youth in India and globally.[52] The Global Youth Action on Tobacco (GYAT) Network is a group of tobacco control activists from around the world who are exchanging ideas to fight back against the tobacco industry.[40] No More Tobacco in the 21st Century (NMT 21C), a global campaign seeks to convene groups of youth world over who envision tobacco-free generations and propose strategies and policies that can protect adolescents/youth from dangers of tobacco. It aims to collectively build peer group norms that support the concept of no tobacco use and restricting access to make a tobacco free generation.[52]

8.3 Individual Level Approaches

Data from the Global Youth Tobacco Survey (GYTS) shows that worldwide approximately 68.7% of students (13 to 15 years), who currently smoke cigarettes have a desire to quit.[26] The teen cessation programmes in settings such as schools, using theories such as motivation enhancement and cognitive behavioral strategies have been effective and have provided efficacious teen cessation results. Cessation programmes which include at least 5 sessions have been shown to provide relatively high quit rates. Pharmacotherapy individually or in combination with

Case Study

School-based multi-component, group randomized trial, Project MYTRI (Mobilizing Youth for Tobacco Related Initiative), conducted in 32 schools (Delhi and Chennai, India), with 14000 students (Grades 6-9) demonstrated the effectiveness of school based interventions in reducing tobacco use among Indian youth by reducing current tobacco use, reducing their future intentions to use tobacco and by enhancing their health advocacy skills. The analysis revealed that tobacco use increased by 68% in the control schools and decreased by 17% in the intervention schools over the two years of intervention. Intentions to smoke increased by 5% in the control schools and decreased by 11% in the intervention schools. Intentions to chew tobacco decreased by 12% in the control schools and by 28% in the interventions schools.[51] These studies provided robust research evidence and have been used effectively to advocate with policy-makers for scaling up the Government of India (GOI) tobacco control efforts. As a result, school health programs form a key component of National Tobacco Control Program (NTCP) that was launched in 2007.The GOI scaled up school health interventions incorporating tobacco use prevention curriculum in all schools across the country.[48]

Youth Zimbabwe Network

Youth Zimbabwe Network, is an umbrella platform for Zimbabwean youth that gives them access to information, support, guidance, training, and resources in order to build their capacity to take on positive, innovative leadership roles in their communities.[57]

counselling has not shown promising results among the adolescents. Telephone counselling has shown to be effective with adolescents whereas internet and text messaging based programmes may be effective if bolstered over a long period.[53] Governments need to develop coordinated programmes and models to move towards Tobacco Free future generation to achieve the vision of tobacco free world.

Summary

Adolescents and children are particularly vulnerable to health effects of tobacco use. Preventing smoking and smokeless tobacco use among young people is critical to ending the epidemic of tobacco use.[54, 55] Public health programs and policies have been in effect to discourage youth and adolescents from using tobacco.[56] Continued efforts and coordinated, multi-component interventions are needed to protect the children and adolescents in India from the burden of tobacco epidemic. It is also important to provide youth and adolescents with requisite knowledge of the public health threat of tobacco to help them develop alertness towards industry strategies.

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CHAPTER 11

TOBACCO CESSATION

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Understand the addictive property of nicotine
2. List the importance of tobacco cessation in preventing tobacco related harm
3. Describe methods for identification and assessment of tobacco dependence
4. List various interventions and strategies to increase motivation and relapse prevention

KEYWORDS

Addiction, cessation, tobacco

1. Tobacco use: A public health problem

Tobacco use, a human created epidemic, kills one third to one half of all people who use it[(1)] across the world, Smokeless form is more common in India both smoking as well as smokeless tobacco is used among all age groups. Although many tobacco users would like to quit, addiction to tobacco results in dependence, distressing withdrawal symptoms, and craving are the primary driving forces (are instead of is and add s at the end of force for maintaining tobacco use. The relative risks for dependence for different addictive substances are shown in Table-1.

2. The addictive nature of nicotine

Nicotine, the principal psychoactive content of tobacco maintains the addiction (Table-2). The neurobiology of nicotine addiction is complex and involves various neurotransmitter systems. Nicotine exerts its pharmacological effect by binding to nicotinic acetylcholine receptors (nAChRs). These ligand gated receptors are widely spread in the central nervous systems. The most abundant nAChR subtypes are homomeric alpha 7 and hetermeric alpha 4 beta 2. Nicotine use by smoking or smokeless directly increases the dopamine in the ventral tegmental area (VTA) by binding on alpha 4 beta 2 subunits located on dopamine cell bodies. The dopamine-regulated mesocorticolimbic pathway from ventral tegmental area to nucleus accumbens and its projection to prefrontal cortex is the final reward pathway involved in various addictions.

During the initial exposure to smoking, the inhibitory neurotransmitter GABA plays an important role. Later, with repeated use of tobacco, the dopaminergic path with desensitization and upregulation of alpha4 beta 2 subunits maintains the habit.[(2)] Recent genome-wide association studies in humans have revealed a clear linkage between genetic variations in the nAChRs and the risk for nicotine dependence.[(3)] The activation of nAChRs influences other neurotransmitters like

Table 1: Relative risk for dependence for different substances

Substance	Proportions of users became dependent
Tobacco	32
Heroin	23
Cocaine	17
Alcohol	15
Cannabis	9
Reference: National Academy of Sciences 1999	

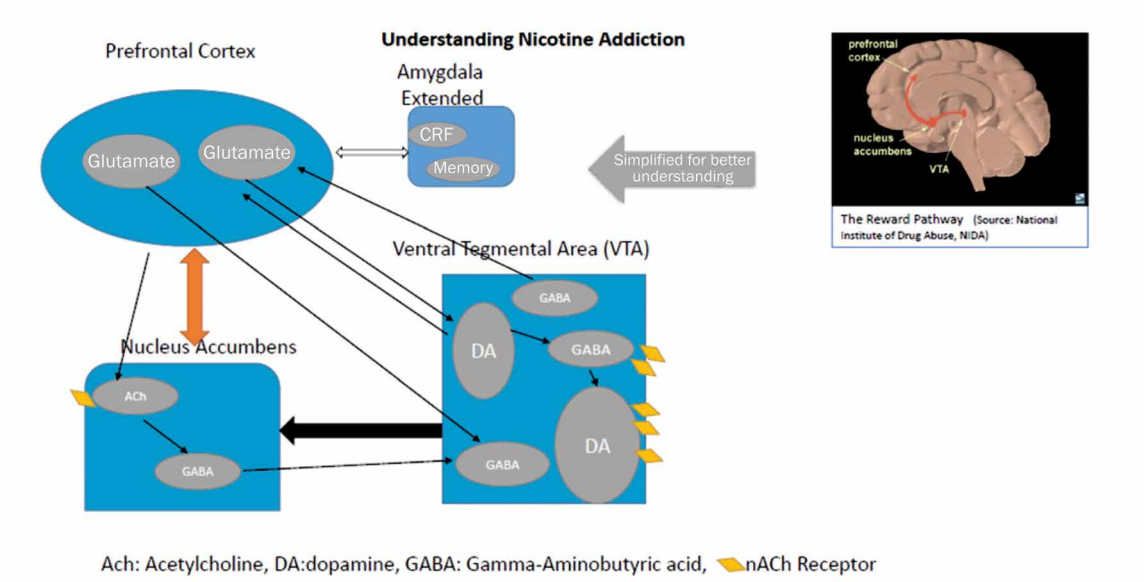

Figure 1: Neurobiology of Nicotine Addiction

Reward pathway or mesocorticolimbic pathway, extends from ventral tegmental area (VTA) of the midbrain to the nucleus accumbens, part of basal ganglia. This further extends upto to the prefrontal cortex, which is involved in decision making and error detection. Nicotine from tobacco binds to the acetylcholine receptor located at VTA and directly stimulate release of dopamine (DA). The other receptors like GABA, glutamate, opioid etc. play an indirect role in reinforcing the addiction on regular and long term nicotine use.

Table 2: Nicotine : An Addictive Chemical

◆ Nicotine, the addictive component of tobacco, binds to midbrain nicotine cholinergic receptors and releases a surge of dopamine.
◆ Dopamine, a neurotransmitter of the reward pathway, is responsible for reinforcing effect of nicotine.
◆ Delivery of nicotine from tobacco plays a significant role in its repeated use. Immediately following inhalation, smoking delivers a bolus of nicotine in cerebral arterial circulation. Use of smokeless tobacco produces slower delivery of nicotine.
◆ Much of the ‘‘relaxation and pleasure’’ associated with nicotine use may simply be a brief interruption of withdrawal symptoms, including restlessness, anxiety, depression, irritability, impatience, difficulty concentrating, insomnia, and increased appetite.
◆ Nicotine dependence is a chronic relapsing medical disorder like ulcerative colitis or diabetes.

Table 3: ICD 10 Diagnosis of Nicotine Dependence

◆ Compulsion to use the substance
◆ Impaired control over substance-taking behaviour
◆ Physiological withdrawal state upon reducing or ceasing use,
◆ Evidence of tolerance (requiring higher doses to achieve the effects originally produced by lower doses)
◆ Progressive neglect of alternative pleasures or interests because of substance use
◆ Persisting with use despite knowledge of harm.

noradrenaline, acetylcholine, glutamate and GABA. This leads to nicotine effects (positive) on locomotion, nociception, anxiety, learning and memory. (Figure 1)

The diagnostic criteria for Nicotine Dependence as per the International Classification of Diseases (ICD 10, F 17) is provided in Table 3. A definitive diagnosis of tobacco dependence can be made if 3 or more of these criteria have been present together at some time during the previous year.

3. The Importance of Tobacco Cessation: Preventing Tobacco Related Harm

Aggressive tobacco control has been associated with substantial benefits. It has been estimated that if adult consumption were to decrease by 50% by the year 2020, approximately 180 million tobacco-related deaths could be avoided.[4] Cessation of tobacco use at any time in life has been found beneficial. Control of the tobacco epidemic and tobacco cessation needs multiple approaches including taxation, regulation and prevention of tobacco use as well as support for tobacco cessation by all health professionals.

Spontaneous quit attempts in the Indian population are very low and it has been suggested that only 2% of users quit on their own.[5] About 38.4% of smokers and 35.4% of smokeless tobacco users had made an quit attempt in the previous year.[6] Among persons who sought a health consultation, less than 50% (smoking:46.3% and smokeless: 26.7%) were asked or advised to quit tobacco and less than 10% provided any form of counseling or pharmacotherapy. A recent study from India has shown that less than 25% of physicians do a detailed assessment including severity of addiction and assessment of motivation.[7]

3.1 Identification and Assessment

Most health professionals miss the opportunity to advise their patients on the risks of continuing tobacco use and the benefits of cessation (Table-4). Providing simple counseling with proper use of pharmacotherapy, when required, is more cost-effective in many Indian settings compared to specialized and more intensive counseling.[8]

The first step in providing tobacco cessation is screening for tobacco use. Clinicians sometimes feel hesitant to ask about tobacco use and think that it is the personal choice of the patient. Each and every patient needs to be asked about their tobacco use either in the routine assessment and in the physical examination as shown in the table 5 and 6.

Educational posters, video clips, information about effective treatment, stories of successful quitting, in the waiting hall helps to break such barriers and facilitates treatment seeking.

Often, it is simple to remember the acronym 3 A's as ASK-ADVICE-ASSIST.

'Identification and Assessment' deals with the 'Ask' component of 3 A (Ask-Advice-Assist) strategy. The ASK component consists of enquiring about tobacco use, types of tobacco, its quantity/frequency, duration, early morning use, etc. Checking about the number of previous attempts and current willingness to quit help to understand the stage of motivation of the patient. The stage of motivation to quit can be broadly divided into a. Not ready b. doubtful (ambivalent) c. Ready to quit/decrease (Figure 3). In view of high heritability of tobacco addiction, it is useful to check regarding family history of tobacco use among first degree relatives. A detailed intake proforma is being regularly used at Tobacco Cessation Centre, NIMHANS and can be provided on request by the authors.

Table 4 : Possible reasons for underemphasis on Tobacco Cessation by the Health Care Provider

◆ Lack of awareness of the range of harm
◆ Lack of awareness of the benefits of quitting
◆ Lack of awareness about treatment
◆ Lack of effective treatment services

Table 5: Integrating tobacco use as well as other drug use as a part of routine assessment

◆ History taking
◆ Presenting complaints
◆ Past History
◆ Family history
◆ Personal History- ask for lifestyle factors (diet, exercise, tobacco, alcohol any other drug use).
◆ If no current use of tobacco, ask whether past user, and reason for quitting.
◆ Vital Sign Recording: Pulse, BP, Temperature, Respiratory Rate, Tobacco use status (Current, former, never)

Table 6: Physical examination in a tobacco user

◆ General Physical examination: Nicotine staining, clubbing, lymph node enlargement, signs of heart failure, peripheral pulses for evidence of peripheral vascular disease
◆ Oral examination: stained teeth, submucosal pigmentation, fibrosis, erythroplakia, leucoplakia, other pre-malignant conditions
◆ Respiratory System: Cough, hyperinflated lungs with diminished chest expansion, rhonchi on auscultation, evidence of cavity or fibrosis of lung suggestive of tuberculosis or malignancy
◆ Cardiovascular system: Hypertension, arrhythmia, evidence of chamber hypertrophy or failure
◆ Abdominal examination: Organomegaly, other signs of neoplasm (gastro-intestinal, genito-urinary, extra-abdominal)
◆ Neurological: Eye examination for toxic (tobacco) amblyopia and macular degeneration, peripheral neuropathy, localising or lateralising signs
◆ Behavioral symptoms not applicable in physical examination (Mental examination): Irritability, restlessness, anxiety, depression

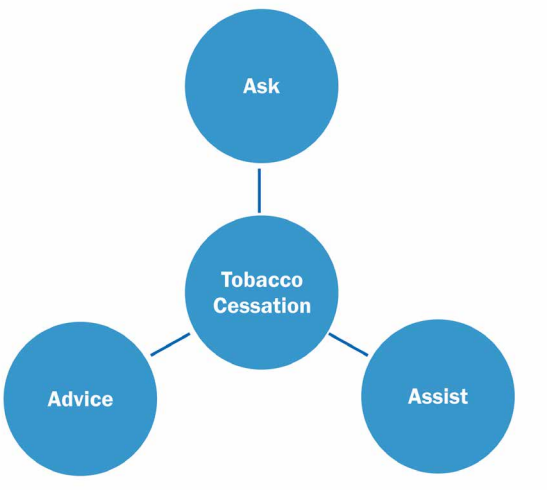

Figure 2: 3As of Tobacco cessation

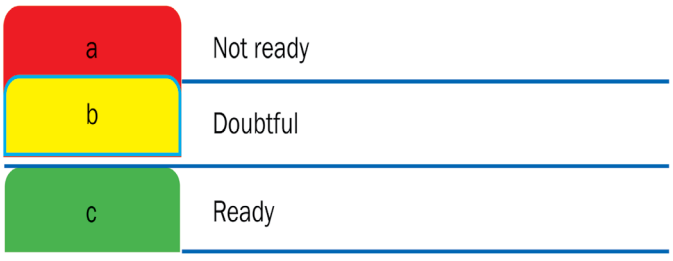

Figure 3: Readiness (motivation) assessment

3.1.1 Fagerstrom Test for Nicotine Dependence (FTND)

FTND[9] and FTND-smokeless[10] (Figure 4) has been widely used as a screening test to find out the severity of physical dependence of tobacco use. The higher the score, more severe the dependence and the need for intensive intervention (Figure 4).

3.1.2 Investigations

Specific investigations associated with tobacco-associated harm can help to give a feedback to the patient.

1. *CO (Carbon Monoxide) estimation:* This simple and inexpensive instrument measures carbon monoxide, an indicator of recent smoking, in the exhaled air. Level above 7ppm indicate recent heavy smoking.
2. *Lung Age :* In case of chronic smokers, the forced expiratory volume (FEV1) shows disproportionate decrease with time. The FEV1 can be easily assessed by handheld spirometer. The formula below[11] (Table 7) provides the current lung age. Providing feedback on lung age has been found to improve quit rates.[12] Telling a patient: "your chronological age is actually 45 years but your lungs are those of a 65-year-old man" is often the best motivator for quitting even if a person is still asymptomatic or has not yet recognized that he/she has symptoms.[13]
3. *Urinary cotinine:* Cotinine is the predominant metabolite of nicotine and can be used as a biomarker for tobacco exposure. It is detectable upto one week after tobacco use. In addition to urinary cotinine, it is also possible to do salivary and blood cotinine estimations to monitor tobacco free status. A cotinine level of less than

Fagerstrom test for smoking

1.	How soon after you wake up do you smoke your first cigarette?	
	Within 5 minutes	3
	6 to 30 minutes	2
	31 to 60 minutes	1
	More than 60 minutes	0
2.	Do you find it difficult to refrain from smoking in places where it is forbidden?	
	Yes	1
	No	0
3.	Which cigarette would you hate to give up the most?	
	The first one in the morning	1
	All others	0
4.	How many cigarettes do you smoke per day?	
	10 or less	0
	11–20	1
	21–30	2
	31 or more	3
5.	Do you smoke more frequently in the first hours after waking up than during the rest of the day?	
	Yes	1
	No	0
6.	Do you smoke when you are so ill that you are in bed most of the day?	
	Yes	1
	No	0

Modified Fagerstrom test for smokeless tobacco users

1.	How soon after you wake up do you use your first dip/chew?	
	Within 5 minutes	3
	6 to 30 minutes	2
	31 to 60 minutes	1
	After 60 minutes	0
2.	How often do you intentionally swallow tobacco juice?	
	Always	2
	Sometimes	1
	Never	0
3.	Which chew would you hate to give up most?	
	The first one in the morning	1
	Any other	0
4.	How many cans/pouches per week do you use?	
	More than 3	2
	1–3	1
	1	0
5.	Do you chew more frequently during the first hours after waking up than during the rest of the day?	
	Yes	1
	No	0
6.	Do you chew when you are so ill that you are in bed most of the day?	
	Yes	1
	No	0

Figure 4 : Fagerstrom Test for Nicotine Dependence (FTND)

Table 7: Lung age calculator

◆ Men: Lung age=2.87×height (in inches)−(31.25×observed FEV1 (litres)−39.375
◆ Women:Lung age=3.56×height (in inches)−(40 ×observed FEV1 (litres)−77.28

Table 8: Advice

◆ Encourage quitting
◆ Educate about addiction and its components.
◆ Use a model as for chronic lifestyle disorders i.e. Hypertension
◆ Provide brief counselling
◆ Provide a self-help booklet
◆ Offer medications if needed
◆ Follow up

10ng/ml is considered to be consistent with no active smoking. However, persons on nicotine replacement therapy would test positive and thus its role in monitoring tobacco use status is limited in this group.

While an interpretation of investigations providing feedback about harm is more likely to motivate persons to consider quitting, at the same time, not having investigations should not be considered as barrier to provide treatment.[14]

3.2 Brief Intervention

Brief intervention (BI) or Advice (second A of 3 As) can be delivered by any health professional, preferably the treating doctor.

The important steps of intervention are provided in Table 8. [15]

a. Advise all current tobacco users to quit

All health professionals should advise their clients to quit tobacco. Simple advice to quit by the physician has been shown to increase the quit rate (OR 1.3; 95% CI 1.1-1.6) compared to placebo or no intervention. [16] The advice should be strong, relevant and personalized. It has been seen that specific advice linked to the patient's clinical condition works best.

Example: For a tobacco user recently diagnosed as hypertensive.... (Hypertension, and CVD are known to worsen by continued tobacco use)

"Your blood pressure is high. I would like to monitor it before considering putting you on any medication. Right now, you will need to be careful with your diet, and make sure you learn how to handle tension. Your blood pressure control can get worse if you continue to use tobacco. Even if I need to put you on treatment for blood pressure in the future, remember that the treatment will be more effective if you stop using tobacco."[17]

b. Educate about the addiction

It is important to understand that addiction is a brain disease and having craving, withdrawal symptoms are part of this illness.

c. Provide brief Counselling

Knowing that the physician/counselor will provide support for cessation and specific help to deal with withdrawal itself increases the tobacco user's motivation and confidence to quit. Counselling also includes fixing a quit date, making environmental manipulations, tackling withdrawal symptoms and handling relapses (Table 9).

d. Offering medications

Evidence is accumulating that providing medications improves the outcome even in the person who is not contemplating complete quitting.

e. Follow up

It is important to have regular contact with the person.

Studies have shown that spending as little as three minutes increases overall abstinence rates. However, spending more time is associated with better outcome. [19] Preliminary experience of the TCC clinics in India has shown that retention in follow-up increases the chances of quitting.[20]

Table 9: Effectiveness of counseling [18]

Type of intervention *Smoking cessation counseling*	Strength of evidence	Risk ratio (95% CI) (Placebo or no treatment : 1)
Individual	A	1.39 (1.24-1.57)
Group	B	1.98 (1.60-2.46)
Telephone quit line	B	1.37 (1.26-1.50)
Physician intervention, Brief advice to quit	A	1.66 (1.42-1.94)
Brief counseling	A	1.84 (1.60-2.13)

f. Technology-based counseling

Technology-driven intervention using telephone based counseling, mobile messaging and web and computer-based counseling have gained popularity in the current decade. Meta-analyses suggest an OR of 1.56 (CI-1.38 -1.77) for telephone counselling. An RCT of an intense 1-year internet-based programme showed significantly higher self-reported point abstinence at 1,3,6 and 12 months with an OR of 3.43 (95% CI 1.6 -7.3).[21]

3.3 Enhancing Motivation to quit

In patients still not willing to quit or decrease tobacco use, the objective is to tilt the balance towards quitting. This can be achieved by discussing the advantages/ disadvantages of using versus stopping tobacco use. Developing discrepancy, eliciting motivational statements i.e. why should you quit? expressing empathy, avoiding argumentation and supporting self-efficacy are important strategies.

This needs multiple sessions of counseling. The aim is to motivate the person to completely quit or decrease tobacco use. It is useful to provide an educational booklet and give a future appointment for the tobacco user who is not willing to quit. Such a person can be referred to counsellor who is trained in motivational interviewing techniques.[22]

The key recommendations of brief counselling or advice are mentioned in Table 10.

4. Relapse Prevention

Just like any other chronic disease which is prone to remissions and relapses, it is highly likely that persons addicted to tobacco may relapse after a period of abstinence. It is important to educate patients about the likelihood of relapses and how to deal with them positively. Also, identifying triggers for relapse in advance and discussing alternate ways of dealing with such triggers, particularly urges and craving, developing a healthy lifestyle, learning how to deal effectively with tension or mood changes and engaging the support of family and friends in addition to support provided by the health provider are all important components of relapse prevention counselling.

5. Assisting Cessation: Medications

Medications aim to reduce the intensity of withdrawal, craving and preventing relapses. Addition of pharmacotherapy along with counselling improves the likelihood of quitting.[24] Experience of tobacco cessation clinics in India in the last ten years on over 30,000 patients (predominantly smokeless users) suggests that adding pharmacotherapy improves the likelihood of tobacco cessation.[25]

Broadly there are two form of pharmacotherapy:

1. Nicotine based: Nicotine Gum, Patch, Lozenge, Spray, Inhaler
2. Non-nicotine based: Varenicline, Bupropion, Nortriptyline, Clonidine

5.1: Nicotine Replacement Therapy (NRT)

Nicotine Replacement Therapy (Table 11) delivers nicotine which is safe and non-toxic. There are three predominant mechanisms by which NRT works i.e. It reduces withdrawal symptoms, partially reduces the reinforcing effects of tobacco-delivered nicotine and may provide some effects for which the patient previously relied on tobacco, such as sustaining desirable mood and attention states, making it easier to handle stressful or boring situations, and managing

Box-1: A Case Study

B, a 35 year villager, started smoking at the age of 15 years and currently smokes 15-20 bidis per day. His father smoked regularly, but has quit after an episode of chest pain two years ago. Last winter, B developed breathlessness and has had an unremitting cough since the last six months. He visited to local doctor, who told him if he continues smoking, the breathlessness will worsen. The doctor advised some medicines for his symptoms and also advised B to quit smoking. He explained that stopping bidi use until the next visit (a week later) would help the lung to heal and improve breathlessness. He told B that during the process of quitting, there could be some distressing symptoms like restlessness and craving. The doctor said that B could handle these symptoms by simple methods like deep breathing, distracting himself when he gets a thought or desire to smoke, to take sips of water and to delay the urge to smoke by not keeping any bidis with him. B followed this advise, but though he could decrease the bidi to 5-7 per day, he was unable to quit completely. During the follow-up visit, the doctor praised B for having made a sincere attempt to quit the habit, and said it was understandable that B was finding it to completely stop, despite his best efforts. The doctor advise him to use nicotine gums (2 mg) 4-6 times daily. He explained to B how to use the gums and also repeated how B could handle any thoughts or cravings if they occurred even after using the gums. At the next follow-up after 2 weeks, B came back and reported that he had been able to stop smoking completely, and his breathlessness had reduced significantly.

Table 10: Key Recommendations: counselling [23]

◆ Counseling for tobacco cessation is effective
◆ Brief intervention even lasting for few minutes is effective
◆ Brief advice to quit by physician increases quit rates
◆ Proactive telephonic counseling is better than simple quitline
◆ Tailor-made web-based counseling might be helpful
◆ In persons not very keen to quit, a clinician advice can enhance motivation and future attempts to quit
◆ Combined pharmacotherapy and behavioral support increases rates of tobacco cessation

hunger and body weight.[26] NRT comes in five forms i.e. gum, pastille/lozenge, patch, inhaler and spray.

NRT significantly increases the likelihood of tobacco abstinence (risk ratio [RR] 1.58; 95% CI, 1.50–1.66) compared with placebo. The overall odds of long term smoking abstinence with different forms of NRT varies from 1.43 for gum to 2.02 for nasal spray.[27] NRT when used in the proper dose and duration, increases the long term abstinence by 50-70% irrespective of treatment setting or type of counseling or type of behavior therapy.

The dose depends on severity of tobacco use. Better outcome is associated with adequate dose and duration. NRT is recommended for a minimum period of 12 weeks. NRT can be initiated even in a person who has not fully decided on quitting tobacco. NRT is recommended for 12 weeks but increased duration of use has better outcome. In a large tobacco cessation clinic based study from India, reported use of NRT was only 10% (2362 out of 23320 patients) along with behavior counseling.[28]

The combination of long acting nicotine patch (slow release, once in 24 hours) along with a short acting formulation (gum, spray, inhaler) has been found to be effective.

5.2 Non Nicotine Pharmacotherapy

The options for non-nicotine pharmacotherapy include varenicline, bupropion, nortriptyline, clonidine and cytisine. Except cytisine all the rest are available in India. Choice of drug is usually determined by the severity of addiction, presence of comorbidities, affordability and clinician's experience. The details i.e. dose and adverse effects and effectiveness of non-nicotine pharmacotherapy is provided in Table 12.

Key recommendations on pharmacotherapy are presented in Table 13 (see page no. 126).

Table 11: Nicotine Replacement Therapy used for tobacco cessation[29]

Preparation	Dosage	Administration	Adverse effects	Advantage
Nicotine Gum/ Lozenge/ Pastille 2mg, 4mg	< 25 cig= 2mg every 1-2 hrly> 25 cig = 4mg every 1-2 hrly (maximum: 24 gums/day)	Chew and Park Method (chew until a tingling/eppery taste is obtained and park in the gap between gum and inner cheek. Continue 30min)	Usually Safe	Effective in controlling withdrawal symptoms.
Nicotine Patch 21mg, 14mg, 7 mg	>10 cigarettes/day d: 21 mg/day <10 cigarettes per d: 14 mg per d	Apply in clean, dry and non-hairy part of the body.	Safe	Provide continuous supply of nicotine to the body.
Nicotine Inhaler 10-mg cartridge	Usual: 6-16 cartridges per d Initially: 1 cartridge every 1-2 h	Patient should inhale into back of throat or puff in short breaths.	Mouth and throat irritation	Delivers nicotine rapidly.
Nicotine Nasal spray	1 spray (1 mgnicotine) in each nostril	Nasal administration	Nasal irritation	Very fast delivery of nicotine

Table 12: Non-Nicotine Medications used for Tobacco Cessation

Drugs	Mechanism	Dosage	Adverse effects
Varenicline	Partial nicotine receptor agonist	1st to 3rd day: 0.5 mg morning OD 4th to 6th day: 0.5 mg BID 8th day to 12th week: 1mg BD Start 1 week before quit date	Generally well tolerated Nausea, Insomnia Need monitoring for mood symptoms especially amng high risk group
Bupropion	Antidepressant	150 mg/d for 3days, then 150 mg twice a day, Start 1 wk before quit date	Increases seizure risk in higher doses
Nortriptyline	Antidepressant	75-100mg per day	Dry mouth, costipation
Clonidine		0.15 mg per day to 0.45 mg per da	Postural hypotension, sedation

6. Smokeless tobacco (SLT): A major concern in India

In India, smokeless tobacco is used more commonly than smoked forms. In the West i.e. Europe and USA the predominant form of SLT is snus, but in India, there are a wide variety of smokeless tobacco forms. The major problem of SLT is the presence of carcinogens i.e. Tobacco specific nitrosamines. In India more than 50% of oral cancers are attributable to intake of smokeless tobacco.

Data from the GATS 2010 has shown that 35% of smokeless tobacco users had tried to quit in the past year and 46% expressed a desire to quit.

Pharmacological treatment of SLT has been derived from the experience with smoking cessation. Nicotine gum, patch and lozenge, varenicline and bupropion SR have been evaluated for the treatment of SLT users. Nicotine replacement therapy (4 studies on patch, 2 studies on gum, 2 studies on lozenges) demonstrated the overall effectiveness as odds ratio 1.4 (95% CI 0.91-1.42) for increasing long term (>6 months) tobacco abstinence rates. This is less than that achieved in the treatment of smoking. Despite this limitation, nicotine patch and gum have shown consistently significant decrease in withdrawal symptoms.[31]

Varenicline has been shown to significantly increase the continuous abstinence rate as well as point prevalence rate among snus users (Odds Ratio [OR] 1.6, 95% CI 1.08 to 2.36). There is a need for further studies (current evidence is only from 2 RCTs) as well as for cessation of other smokeless forms.

Bupropion use has not been associated with better abstinence rate compared to placebo in two published RCTs (OR 0.86, 95% CI 0.47 to 1.57)[32] conducted among snus users. Behavioral intervention incorporating either telephone counseling, an oral examination and feedback about any ST induced mucosal changes, or both, are likely to improve the outcome.[33]

Table 13: Key Recommendations: Pharmacotherapy[30]

◆ Interventions that combine pharmacotherapy and behavioural support increase smoking cessation success compared to minimal intervention or usual care
◆ Pharmacotherapy for tobacco dependence treatment is safe and effective and significantly increases the chance for long-term smoking abstinence compared with quit attempts unaided by pharmacotherapy
◆ NRT is very safe and should be offered to all in proper dose and for duration
◆ The effectiveness of NRT appears to be largely independent of the intensity of additional support provided to the individual
◆ Combination of multiple form of NRT (long duration i.e. patch) with short duration (gum/spray) increases smoking abstinence
◆ NRT should be considered as an aid to smoking reduction even if the person has not firmly decided to quit
◆ Varenicline is most effective agent for smoking cessation (one and half time more than bupropion and twice more than NRTs) but must be regularly monitored for any neuropsychiatric adverse effects
◆ Bupropion and Nortryptiline are other effective agents for smoking cessation

Table 14: TEACH paradigm [34]

Drugs	Mechanism
Training	Train all health-care providers to be familiar with tobacco related harm and tobacco cessation
Education	Educate people in the community as well as health-care seekers about tobacco use there by reducing initiation and encourage cessation
Advice	Advise all persons to quit tobacco
Counselling and Care	Counsel regarding tobacco related harm and offer help (both psychological and pharmacological)
Harm minimization	To reduce exposure to smoke

7. A novel initiative- mCessation

Ministry of Health & Family Welfare, in partnership with World Health Organisation and the International Telecommunications Union, has started an initiative for utilising mobile technology for tobacco cessation. WHO-ITU's 'Be Healthy Be Mobile' initiative, aims to reach out to tobacco users of all categories who want to quit tobacco use and support them towards successful quitting through constant text messaging on mobile phones. The initiative is supported by the Government of India.

The interested individual can register online or through a missed call. The person receives a series of messages which tells them about the important reasons for quitting and prepares them for a total quit day. It supports them through the quitting process through motivational messages and specific tips. The sms messages are supported along with web-based information on reasons to quit, making a quit plan, tips to sleep better, how to manage craving, 10 easy ways to get support and how to manage craving

8. Challenges for Tobacco Cessation in India

There is a huge need for effective tobacco cessation services in our country but the treatment gap is very wide. Tobacco cessation services are available at very few centres. Cessation needs to be part of any regular clinical service and available at any health care facility. The TEACH paradigm (Table 14) is a simple approach to provide tobacco cessation.

Technology assisted training can expand training and increase service provider competencies in providing tobacco cessation in diverse health settings. Through a live multipoint interactive video conferencing facility, the Tobacco Cessation Centre (TCC) NIMHANS, has

imparted 'virtual training' in cessation to participants throughout India as well as neighbouring countries. This 8-week certified online programme has also brought together health professionals from various backgrounds such as dentistry, public health, mental health and other disciplines together with cessation specialists onto an interactive platform.

Summary

Tobacco cessation should be an integral part of any intervention. Studies have shown that the strategies for tobacco cessation training and implementation are indeed cost-effective. Initial efforts in India for cessation included individual counseling along with use of nicotine gum. Recently, a better understanding in neurobiology has paved the way for development of partial nicotine receptor agonists.

One of the major challenges has been lack of wide spread availability of tobacco cessation interventions. As a public health policy, all tobacco users should receive brief counseling and be offered nicotine replacement therapy. Intensive psychosocial intervention as well as medication like bupropion, varenicline etc. can be considered in specialized settings.

Unit Review Questions

1. Which among the following is the most addictive:
   a. Tobacco
   b. Alcohol
   c. Opioid
   d. Benzodiazepine

2. The most addictive component of Tobacco is:
   a. Areca nut
   b. Tobacco Specific Nitrosamines (TSNA)
   c. Nicotine
   d. Polyaromatic Hydrocarbons (PAHs)

3. The major neurochemical involved in the "reward pathway" in the brain and associated with pleasure is:
   a. Arecholine
   b. Dopamine
   c. Serotonin
   d. Acetylcholine

4. Mr A has been smoking two to three packets of cigarettes per day for the last 10 years. He finds it very difficult to quit as there is strong urge to smoke. He has tried many times in the past to decrease but has not been successful. He has undergone counselling before but still could not stop. Mr A can best be helped with:
   a. Nicotine gum 2mg as and when he feels like smoking
   b. Nicotine gum 4mg as and when he feels like smoking
   c. Nicotine gum 4mg every 2 hrly irrespective of his smoking urge
   d. Nicotine gum 2mg every 2 hrly irrespective of his smoking urge

5. Mr X has been using gutkha (smokeless tobacco) round the clock. He keeps the quid constantly in the mouth. He says that without the quid, he cannot do any work. He has tried nicotine gum from the local chemists but that did not help him. He did not like the mint flavour of the gum. Which of the following would be probably the best approach?
   a. Advise him to restart nicotine gum
   b. Prescribe a nicotine patch
   c. Advise him nicotine pastille
   d. Advise him to combine nicotine patch with nicotine gum

6. Among the following drugs, which is associated with the best chance of quitting in smokers?
   a. Varenicline
   b. Bupropion
   c. Nicotine Patch
   d. Nicotine gum

7. Nicotine primarily binds to which receptor in the brain
   a. NMDA
   b. Dopamine
   c. Acetylcholine
   d. GABA

8. All of the following are components of Brief Intervention EXCEPT
   a. Ask
   b. Advice
   c. Assist
   d. Motivation Enhancement

9. Which of the following is most likely to benefit a tobacco user who has come to the physician for chronic cough?
   a. Personalized advice by physician
   b. Advertisement
   c. Educational flyer
   d. Family pressure

10. Which of the following helps in assessing the severity of tobacco addiction?
   a. CO analyzer
   b. Urine cotinine test
   c. Lung age
   d. Fagerstrom test for nicotine dependence

Ans: 1.a 2. c 3.b 4.c 5.b 6.a 7.c 8.d 9.a 10.d

Application question (s)/ Assignment

Case 1. Mr. A, 45 year old teacher, presented to you with breathlessness and chest discomfort for the last one month. He reports that the breathlessness is increasing day by day. On asking, he says he smokes one packet of cigarette per day for the last 25 years. Smoking improves his concentration and provides a sense of relief from both work and home-related stress. He drinks alcohol once or twice a month during social gatherings. He does not perceive any connection between his current symptoms and the smoking.

Please outline the steps in providing tobacco cessation for Mr A.

Case 2. Mrs. M, 35 year female, works as a daily wage in the local garment factory. She is complaining of general weakness and lethargy for the last six months. On general examination, she looks pale and thin. She has a tobacco and betel nut quid in her mouth. She reports that without this tobacco mixture, she cannot do any work. She places the quid in her mouth first thing in the morning and only then is able to start on her household work before going to the factory. Chewing gives her the required energy and she often goes to the factory in a hurry without breakfast as she is not hungry.

Provide a tobacco intervention plan for Mrs M.

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Suggested readings

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Tobacco Cessation materials

1. Tobacco Cessation related IEC materials or booklets including "how to initiate a tobacco cessation service"can be requested from Tobacco Cessation Centre, Centre for Addiction Medicine NIMHANS email: tccbangalore@gmail.com

CHAPTER 12

BEHAVIOURAL CHANGE COMMUNICATION IN TOBACCO CONTROL

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Understand the need for behavioural change communication (BCC) in tobacco control
2. Appreciate the difference between health education and BCC
3. List the steps in BCC
4. Explain major theories in BCC

KEY TERMS

Behaviour change, health education, tobacco control

1. Introduction

Tobacco use became popular worldwide after discovery from America. The high prevalence of tobacco use indicates it to be one of the strongest human behaviours. Despite tobacco use being harmful to health and distasteful, also being not beneficial socially, culturally and spiritually for maintenance of life, the prevalence is increasing in one form or the other especially in low and middle income countries. With the growing evidences on harmful effects of tobacco, the tobacco industry is adopting new marketing strategies to attract new customers and maintain the existing ones by promoting newer forms like light cigarettes(1), filter cigarettes, e-cigarettes etc. The misguided people with poor knowledge on harmful effects of tobacco fall trap to the advertising and promotional activities of tobacco industry. In US, nearly one third of the adults don't perceive any harm from cigarette smoking and more than half belief e-cigarette to be safer than traditional cigarettes. Many of the US adults believe that smokeless tobacco use is safer than cigarettes.(2) The situation could be even worse in developing countries where tobacco use is more common among people from low socio-economic status and people with low education.

2. Factors influencing tobacco addiction behaviour

Many factors influence the initiation and maintenance of tobacco use. Availability, easy accessibility, peer

pressure, use by the family members and lack of awareness on harmful effects along with the tobacco advertising, promotion and sponsorship (TAPS) activities by the tobacco industry drive initiation of tobacco use as well as maintenance of the same. Lack of awareness on consequences of tobacco use in addition to innovative methods of advertisement of different tobacco products by the tobacco industry deter users from quitting tobacco or make their quit attempt unsuccessful. Smuggling of tobacco products makes easy availability of tobacco products at lesser prices.

Socio-economically disadvantaged groups are more vulnerable both in developed and developing countries. A qualitative study from Australia reported smokers from socio-economically disadvantaged group skip meals, substitute food and pay bills later in order to purchase a packet of cigarettes.[3]

3. Need for Behavioural Change Communication

Tobacco use is a behavioural problem in the context of lack of knowledge on harmful effects of tobacco. Tobacco use, as a behavioural problem, is one of the most prevalent and preventable risk factors for non-communicable diseases both globally as well as in India.

A lack of knowledge on ill-consequences of tobacco use makes people vulnerable to initiate and continue tobacco use lifelong. A well informed person is less likely to initiate tobacco use. A simple "Radio message" like light cigarettes are as dangerous as traditional cigarettes makes many smokers think about quitting.[4] Most of the times the smokers are misinformed about the tar content especially in light and filter cigarettes. Most smokers believe that they can stop smoking before serious health problems show up.[5] Tobacco products other than cigarettes are considered to be safe by many smokers. Menthol cigarettes users perceive cigarettes to be less harmful due to soothing effect of menthol.[6]

Despite availability of better alternatives, many tobacco users revert back to tobacco use for varied reasons like fun & enjoyment, stress management, social facilitation, as an aid for concentration, weight control etc. which prevent their quit attempt successful.[7]

4. Behavioural Change Communication Vs Health Education

The desired change in an individual or a group can be brought about either by health education or by behavioral change communication (BCC). The objective of health education is also to modify behaviour. However the behavioral change communication differs from health education in that BCC is intensively interactive and provides conducive environment for enabling people to initiate, sustain and maintain desired and positive behaviours as well as discard harmful behaviours.

5. Theories of BCC

Over the years different theories and models have been proposed for behaviour changes depending on whether it is directed at individuals or community **(Box 1).**

Some major theories are summarised below;

5.1 Health Belief Model

This is based on the personal perception and beliefs regarding severity of the disease. It tries to identify key barriers and stimulators of change in behaviour for desired outcomes.

5.2 Theory of Planned Behaviour

This is based on the principle that people weigh merits and demerits before start practicing. The intention to act depends on their attitude and subjective norms that is whether other people around them are performing and they should also perform it.

5.3 Trans-theoretical (stages of change) model

This is based on the stage of audience with respect to desired action. The process of change is proposed in six stages. The content of behaviour change depends on the stage a person is in. e.g. a person in contemplation needs information where as a person in action needs support.

5.4 Social cognitive theory

This theory proposes that human behaviour is not driven by self but by the external forces. People

Box 1: Theories of Behaviour Change Communication

Level of Theories	Theories	Change process	Targets of change	Emphasis
Individual	1. Health Belief Model 2. Reasoned Action (Fishbein & Ajzen) 3. Stages of Change (Prochaska & DiClemente)	Psychological	Personal behaviours	Planned behaviour, rational decision making process
	4. Fear management (White)			Interaction between cognition & emotion
Interpersonal	5. Social learning (Bandura)	Psycho-social	Social Networks	Social comparison, learning from role models, self efficacy
Community	6. Theory of Gender & Power 7. Diffusion of Innovations (Rogers)	Cultural and Social	Community Development	Social influence, Personal networks
	8. Ecological models			Behaviour is a function of the person and its environment

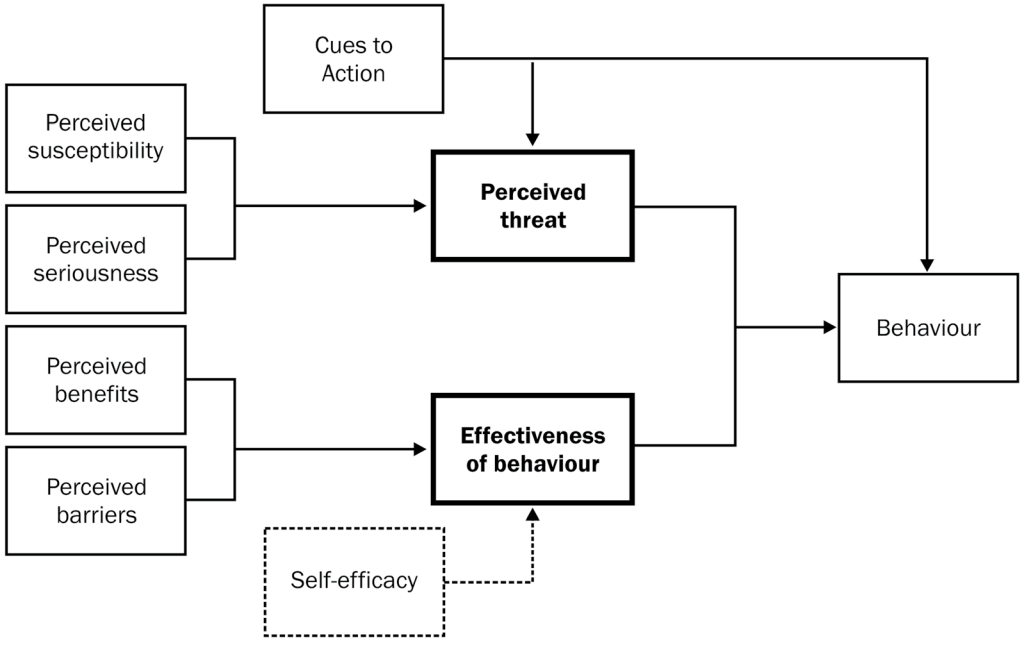

Figure 1: Health Belief Model

(Source: http://www.forestry.gov.uk/pdf/behaviour_review_theory.pdf/$FILE/behaviour_review_theory.pdf)

learn and decide on act by observing action and consequences from others and trying out themselves accordingly. The human act is a triadic interaction of behaviour, personal and environmental factors. The environmental factors include the situation/ circumstances in which the behaviour is performed where as the personal factors includes instincts, drives, traits and other motivational factors like self efficacy, self control, emotional coping, observational learning, reinforcement etc. For example it may be important to provide resources and increase the level of confidence for self efficacy to get the desired behaviour. Many times incentives may be needed despite having self efficacy.

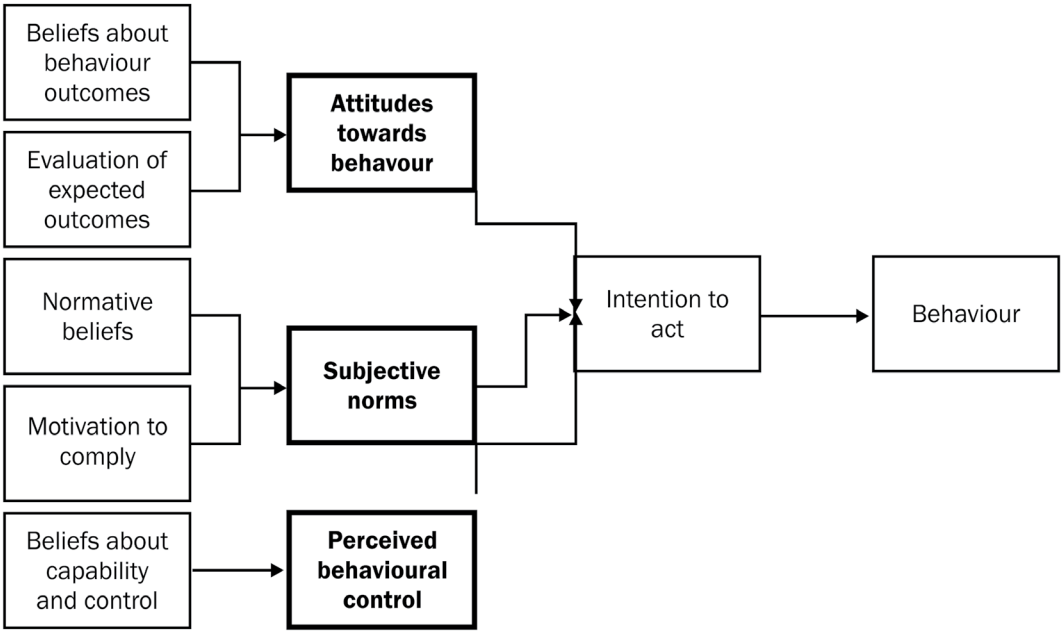

Figure 2: Theory of Planned Behaviour

(Source: http://www.forestry.gov.uk/pdf/behaviour_review_theory.pdf/$FILE/behaviour_review_theory.pdf)

6. Role of Behaviour Change Communication in Tobacco Control

Behaviour Change Communication (BCC) programs are designed to bring about behaviours that will improve health status and related long-term outcomes. Behaviour change communication (BCC) is the strategic use of communication to promote positive health outcomes, based on proven theories and models of behaviour change.

In order to change any behaviour four elements have to come together. These are: **knowledge, motivation, skills and enabling environments.**

Everyone has some knowledge, some skills and the predisposition to be motivated and so the communicator has to assess these and take off from there. This is the reason that some people change their behaviour by just receiving information which they were lacking. They were amply motivated but did not know that the risk could be for them also. Some change as soon as some critical information comes from a very credible source. Some just need a skill to change and if a communicator helps him to develop that competency he changes his behaviour right away. Also many times the behaviour changes as soon as an enabling environment becomes available. For an individual the enabling environment is basically family and friends. If a person tries to quit the use of tobacco but he sees everyone in his family smoking and no one encouraging him to change his behaviour he will not be able to. Many times it is the friend circle which fails to act as an enabling environment. They coax the person into breaking his resolve or they make fun of him and call him a sissy.

BCC employs a systematic process beginning with formative research and behaviour analysis. Behaviour analysis is a prelude to imparting knowledge. Behaviour analysis gives clue as to where to begin while attempting to educate the target population.

When professionals first become interested in changing health-related behaviour, the emphasis is on providing information to patients or the public. The assumption is that a well-informed population would take the necessary action to protect itself from and prevent illness. Early analysis as well as experience has revealed that information does not necessarily 'inform' people. A part of that process which brings about changes in people's behaviour takes information and converts into knowledge. 'Information' and 'knowledge' are two words which are currently often taken within the health community to mean the same thing. There is a trend to replace the word 'information' with 'knowledge' while helping people to change their behaviour. It is worrying trend

because it suggests a lack of appreciation for the complex process involved in converting information into knowledge.

Information is a raw input used in creating knowledge. Information is created once it is spoken, printed on paper, recorded on tape or broadcast over the airways.

The person or group with the strongest capacity to disseminate information is usually in a better position to influence action and changes in individuals and community. Whether a group or a person succeeds in doing this depends upon their ability to disseminate their information in a way that people can use it in creating knowledge essential for changing behaviour.

Table 1: The stages of change model (Prochaska & DiClemente)

Stage	Stage definition	Process	Process definition	Psychotherapy Intervention
Pre contemplation	Individual is unaware of problem; No intention to change behaviour in foreseeable future	**Consciousness raising**	Increasing information about self and problem	observations, confrontations, interpretations, bibliotherapy
		Dramatic relief	Experiencing and expressing feelings about one's problems and solutions:	psychodrama, grieving losses, role playing
		Environmental re-evaluation	Assessing how one's problem affects physical environment	empathy training, documentaries
Contemplation	Individual is aware of problem; Serious consideration of change in behaviour	Self evaluation	Assessing how one feels and thinks about oneself with respect to a problem	value clarification, imagery, corrective emotional experience
Preparation	Individual is intending to take action	Self liberation	Choosing and commitment to act or belief in ability to change	decision-making therapy, New Year's resolutions, logo therapy techniques, commitment enhancing techniques
Action	Individuals modify their behaviour, experiences and/or environment in order to overcome problem	Counter conditioning	Substituting alternatives for problem behaviours	relaxation, desensitization, assertion, positive self statements
		Stimulus control	Avoiding or countering stimuli that elicit problem behaviours	restructuring one's environment (e.g., removing alcohol or fattening foods), avoiding high risk cues, fading techniques
		Helping relationships	Being open and trusting about problems with someone who cares	therapeutic alliance, social support, self-help groups
		Reinforcement management	Rewarding one's self or being rewarded by others for making changes:	contingency contracts, overt and covert reinforcement, self-reward
Maintenance	Individual works to prevent relapse and consolidate gains.	Social liberalisation	Increasing alternatives for non-problem behaviours available in society	advocating for rights of repressed, empowering, policy interventions

Source: http://www.forestry.gov.uk/pdf/behaviour_review_theory.pdf/$FILE/behaviour_review_theory.pdf

The process of taking information and transforming into knowledge begins by people choosing to receive information and taking note of it. The success of this step depends on the information being presented in a language and media format which the people understand and can remember. It also depends upon the information being communicated in the medium to which people have access. People must trust the source of information as credible. The information should be related to their needs and lives. People should be able to remember the information which they have sieved through in a way which can be accurately retrieved when the opportunity arises for them to apply the information. For example if a person has understood that bidi smoking is harmful, then as soon as someone offers him a bidi or he sees a bidi at a vender, he should be able to recall that information and abstain from smoking.

Thus information takes on meaning and becomes knowledge only after it has been explored in the context of our lives. We know something in a useful sense when we are able to create meaningful links between information and its application in a specific situation.

For example if we tell people 'smoking kills', we have to really make them understand what it entails; does it mean it will kill you as you start smoking or how long do you have to smoke before it kills you, would it kill you if you smoke only one cigarette a day or would it kill you if you smoke fifty cigarettes a day, would it kill you if you smoke in the company of other people or when you are alone, would it kill you if you smoke bidi or will it kill you if you smoke only cigarettes so on and so forth.

There are two ways in which the information needs are assessed. One way of doing is to enter into a dialogue with the person/community or survey the community. However if the time is a constraint it can be done fairly quickly by creating a list of statements and having the individual or the community respond to those statements along with a scale of seriousness—like the Likert Scale. The statements have to be exhaustive of the concept.

However, knowledge alone cannot change behaviour. That is to say that knowledge has to be packaged and delivered in a form that is motivating. A person could have all the knowledge but if he is not motivated the chances are that he will not change his behaviour. Motivation is needed to act. A good programmer is that who gives the information in a form that motivates the person; the recipient. It is one thing to say that tobacco use could kill you but it is another to show how it can kill or has killed. The Voice of the Tobacco Victims is an initiative which along with information also has motivation—not to take up or continue the use of chew tobacco. Motivation is closely linked to the nature and format of the material through which the information is imparted. Material has to be: Easy to understand, realistic, credible, interesting, practicable, educationally sound, not looking down on any segment of the population and not to hurt any ones sensibilities.

A person who has the knowledge ,is convinced and motivated to quit the use of tobacco would have to learn the skill to quit. If motivation is the driving force to act, skill is the ability to act. It is a psychosocial competency which enables the individual to behave in a pro-active and constructive way in dealing with his/her own self.

In the context of quitting tobacco use it is a specialized skill which involves a few steps. But of course this is not to say that no one gives up on their own yet it is less torturing if one can learn the steps from a trained professional. One of the reasons is that withdrawal symptoms can be at times too painful and can shake the resolve and defeat/ lowers the motivation to try again. The steps of preparation to quit which is quite ritualistic, actual quitting and maintenance. The person has to become familiar with his triggers and have to get prepared to avoid them and has to learn what to do when withdrawal bothers. As nicotine addiction is known to be stronger than heroin, it will require specialized skill to deal with it.

The last element in helping people to quit is enabling environment which will facilitate and hasten quitting. Enabling environments is in the form of support by the family, friends support and at a larger level a tobacco legislation which has strict implementation. India has a legislation which bans promotion of tobacco products—which is a trigger for many, also bans smoking in public places which again is a strong trigger seeing other people smoking it is a challenge to control. Besides this there are innumerable triggers which the person who is trying to quit has to be aware of in order is either avoid them or tread very carefully. The enabling environments at the person's familial and social level have to be supporting and it is not easy to garner their support, however, the counsellor can train you to manage that.

Box 2: Information need assessment assessing the information needs of an adult who has to be taught the right way of brushing teeth with a brush

Introduction: I gather you are considering learning a better way to take care of your teeth. I can help you. Do you mind answering a few questions which will enable me to assess what would be the most expedient way to help you in which you can be benefitted the most?

You will have to check each item by level of need-- Do not know at all (0)—know a little bit (1)—know a lot (3)

Items	1	2	3
Need to know which type of brush to buy?	-	-	-
Need to know which tooth paste is better?	-	-	-
Need to know how to hold the tooth brush?	-	-	-
Need to know the direction in which to move the T B	-	-	-
Need to know how to get to inside teeth?	-	-	-
Need to know how often to brush teeth?	-	-	-

Etc Etc

The analysis of these items will tell you what all he needs to know in order to learn how to brush his teeth right. When we say tobacco kills it is like saying brush right to save teeth. You can imagine how much any one can learn from the statement.

Case study 1: An intervention study on tobacco habits among rural Indian villagers in Kerala, Andhra Pradesh and Gujarat

(This study is part of a project of the Tata Institute of Fundamental Research, Bombay in which the scientists wanted to find out if the existing precancerous lesions in the oral cavity of the tobacco users will regress/disappear if users of tobacco were to quit the use)

This case study was conducted to demonstrate the feasibility of using communication strategies to enable the users of tobacco to quit its use. About 12000 tobacco users, aged 15 years and above from three districts in India (Bhavnagar, Srikakulam & Ernakulam) were included.

The intervention programme was carried out by a combined team of dental surgeons and social scientists. The dental surgeons would examine the mouth to assess and ascertain the presence of lesions/cancer and the general condition of the cavity. The social scientists were given special training in conducting in-depth interviews by approaching and interacting with the tobacco users in a manner that it will help to elicit the true response. They were trained to gauge the readiness of the user to quit by assessing his knowledge, motivation and skill. Additionally the social scientists were made ready to interact with users and deliver a communication designed by the BCC expert.

A programme of intervention was developed after appropriate pilot and pretesting surveys. In-depth interviews of the participants were conducted to investigate: 1) reasons for their starting and continuing the tobacco habit (such as when and how the habit started, who encouraged it, was it a peer or a parent?; 2) the perceived implication of the habit in its social, economic and health aspects; and 3) possible reasons for giving up their habits.

The steps to be covered required a therapeutic person to work on graded tasks

1) By approaching the user with an attitude of total acceptance and to avoid being judgemental. At the same time be considerate, sympathetic and to be never condescending in any way. It was stressed that the habit of tobacco use has to be regarded as a health and not a moral problem
2) Assist the user to get relief from discomfort or pain from minor complaints by giving him medication

3) All work to be addressed by using tools of understanding, encouragement and support. All the steps were to be participatory in addition to being user-based/user-driven by involving the user completely

Before designing the communication strategy, it was necessary to understand why and how the villagers take to tobacco use. Do they also take up the use of tobacco for the same reasons as in the rest of the world — namely due to peer pressure. parental influence, media and role modelling. This step was critical as it will determine the communication approach and content to achieve the objective of helping them to quit the use of tobacco. This investigation rendered useful information to build the first step to help them to gain knowledge on the consequences of using tobacco.

Case Study-1 (Contd.)Qualitative Analysis of Tobacco Use Behaviour

Many villagers in India know of no health hazards connected with tobacco. In fact, if anything, they believe in medicinal and multi-magical properties of tobacco. Whereas for some people tobacco is a panacea for all troubles connected with toothache (they actually are advised to use tobacco by their friends, parents and neighbours as a remedy for toothache), for others it is a means of getting rid of the foul smell in the mouth, for controlling ailments of the stomach (like gas, bloating, constipation etc,) for postponing hunger and warding off sleep.

The young boys see their fathers smoking/ chewing. They believe their fathers to be doing the right thing and they follow them unconditionally. These boys are usually sent by their fathers to buy bidis and they commonly pilfer a few from the bundles purchased for their own surreptitious smoking. Young boys find images in bidi advertisements very attractive. Often these advertisements have the pictures of movie stars and movie stars have a lot of charisma for these young people.

Young men take to smoking, often to appear modern, open minded, tough, smart and, sometimes, to show they are educated. Parents often send their young boys to work in the farms of other people, as labourers. The atmosphere there is conducive to smoking ”everybody smokes, so I should too”. Many employers, such as the local tea shop owners or village grocery store owners, give free bidis to the boys to encourage and draw them to their shops. In addition, since much of the leisure time activities in villages consist of getting together to chat, such social gatherings also become an occasion for taking up the habit of using tobacco, A young boy who is not smoking is coaxed into it by his friends - “smoking adds glamour to get-togethers” they believe. “If you want to go to the city to work, you have got to learn smoking to look smart . . . It is a sign of being grown up, being independent and being carefree” - is the advice given to many.

The analysis of existing behaviour reveals that the acquiring of tobacco use was very complex and intricate, therefore the strategy which is likely to be effective in helping them to quit is one which takes into account a comprehensive understanding of the target population, not just their tobacco habits but their total life style, their beliefs, the way they live and work and what attracts them to tobacco.

The intervention used two approaches: personal communication, and mass media.

Personal, communication involved one-to-one interaction with the target population with a view to helping them sort out doubts and learn behaviours that would result in abstaining from tobacco use. The steps in personal communication were worked out in a logical order recognizing the dynamics of human psychology and what it takes for people to make decisions and change their attitudes and behaviour.

Two films were produced specifically for this phase of the study. The objective of the first film was to give information and create a knowledge base (to understand the relationship between tobacco and oral cancer). The objective of the second film was to empower the users to quit the use of tobacco in the light of what made them take it up in the first place. Film being a visual medium has the power to inform and also motivate the viewer to take a quick decision and change behaviour especially when in addition to viewing the film it is also discussed with the audiences to ensure that all their questions and doubts are clarified and they get from the film what was the intended message.

We also made posters which were displayed to remind the target population that they ought to be reconsidering their tobacco habits. Two kinds of posters were used, one with a written message only and the other with a visual display along with a written message.

Slides were prepared from the posters and were projected in movie theatres in the vicinity to serve as a reminder.

Case Study 1 (Contd): Stages of Intervention for changing tobacco use behaviour

Certain visuals from print as well as from the field (live cases) were used in the personal communication which facilitated not only the understanding but also motivated them to make a decision on their use of tobacco. Similarly the films motivated them due to the emotional appeal. Motivation is a driving force and without it the knowledge gained stays passive. Motivation adds a reason for acting or behaving in a particular way.

Accordingly the first and foremost task of the interventionist was to make the tobacco user become aware of the structures within the oral cavity and what chewing/smoking does to the mucosa. When the link between tobacco habits and oral cancer was explained through the visual presentation of oral precancerous lesions, they not only understood but also believed in the relationship. The overall motivating factor for this project was the high prevalence of oral cancer among their own people.(One-third of all cancer cases are oral cancer.).

When the relationship between tobacco use and the occurrence of oral problems seemed to be convincing them, they were urged to articulate their thoughts on tobacco use. This was repeated over time till they asked for help to give up the use of tobacco.

Various possible ways of giving up the tobacco habits were presented along with its pluses and minuses. Not only that, we also tried to gauge what method will possibly work with them from the way they reacted to the suggestions and from the questions that they asked. Their preference for a particular way of quitting was paramount.

They were warned about the withdrawal symptoms but also assured that they are manageable and short lived. Most of them realized that quitting was beneficial not only for health but for finances and for aesthetics. Further support and encouragement were given to those who attempted but failed to give up their tobacco habit in the first go. Appreciation and applaud was offered to those who succeeded by conveying to them that they had done the right thing. A model and leadership role was suggested to them.

Briefly, the stages of intervention used in the study were:

- Information regarding association of tobacco habits and oral cancer was imparted
- This information was further strengthened by visual reinforcement through flipcharts, posters, films, etc
- Information of the health benefits and other advantages of quitting the habit were conveyed; for example. Regression of lesions and saving of money from sickness and treatment
- Various possible methods of discontinuing the tobacco habit, such as “cold turkey”, gradual reduction, postponing the first smoke or quid etc. were described and the most appropriate one for the subject was suggested depending on the psychological profile of the subject and characteristics of the habit
- Withdrawal symptoms were explained and emphasis placed on their temporary nature
- Appropriate praise and reinforcement were given and leadership roles suggested for successful quitters

As a routine after every yearly visit handwritten posters summarizing the findings about the particular village were left behind to remind subjects that they had been examined for oral cancer.

Articles were published in newspapers to inform and educate people about oral cancer. It was known that many members of the target population do not read; nevertheless, the articles could be read by some, including school children, who have been found to be important agents of change in rural India.

There were folk drama enactments with the objective of talking about the prevalent superstitions and misconceptions about tobacco.

Case Study 1 (Contd) Results of cessation of tobacco use by BCC intervention

The various methods of communication were assessed individually, through carefully designed questionnaire-based sample studies for their impact relative to their objectives. Since all of the communication methods could impinge on an individual's decision to quit or reduce tobacco use, it is hard to ascertain which actually led to the decision. A rank ordering of the various inputs was assessed by the target population who revealed that subjects have been helped the most by one-to-one interaction: cessation camps had also aided them immensely. One-to-one communication helped the participants the most. The reason given for this was that they were able to ask all kinds of questions in their minds. It gave them the opportunity to resolve their doubts and misunderstandings and develop a rapport with the programmers. The cessation camps were conducted only in Andhra Pradesh where they were rated on the same level as one-to-one communication. The camps also succeeded in providing participants with a sense that they were not alone in facing their problems.

Results of cessation of tobacco use in successive follow-ups: Percentage stopping tobacco use

Follow-up	Bhanagar	Srikakulam	Ernakulam
1st	4.1	2.0	4.9
2nd	7.6	4.4	10.9
3rd	10.5	6.4	14.2
4th	11.6	7.6	15.4
5th	12.3	9.4	16.6
6th	14.1	11.2	17.0
7th	11.5	11.6	17.3
8th	12.2	12.3	17.4
9th	12.7	13.1	18.1
10th	13.6	14.0	18.8

Summary

Tobacco use is a preventable risk factor for non-communicable diseases and is strongly associated with human behaviour. Very often an individual develops this behaviour as a result of easy accessibility and availability of the product. Some other factors which helps the easy adoption of this habit are peer pressure, use of the product by the family members and due to promotional activities by the tobacco industry and more importantly due to a lack of knowledge on the harmful effects of its use.

Since nicotine in tobacco is extremely addictive quitting is not very easy. However, it is not impossible either as we see the number of ex-smokers increasing in a number of countries where they took it upon themselves to change the norms from smoking to nonsmoking and to facilitate this a number of tobacco control provisions have been launched including offering help to quit (cessation).

Unit Review Questions

1. Explain the steps involved in behavioural change communication.
2. List the various theories and models of behavioural change communication. Briefly describe transtheoretical model of behavioural change communication.
3. Write a note on "Formative Need Assessment".

Application questions

1. Explain the statement "Behavioural change communication is a better strategy for tobacco control than Health education".

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Suggested readings

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CHAPTER 13

ECONOMICS OF TOBACCO CONTROL

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Understand the size and importance of tobacco in the Indian economy
2. Understand basic economic principles to explain the demand for and supply of tobacco
3. Understand the concept of elasticity and apply that in the context of tobacco taxation

KEYWORDS

Affordability of tobacco; cost of tobacco; demand for tobacco; price elasticity; regressivity of tobacco taxes; supply of tobacco; tobacco Economics; taxation

1. Introduction

It is well known that tobacco consumption causes illness and premature death while imposing financial burden on its users, their families and the society at large. Similarly, tobacco cultivation, production, and sale generate employment opportunities for people and create financial gains for those involved in it. Tobacco being a commodity that brings substantial tax revenue to the government it is important that policy makers get a balanced view of both the costs and benefits of tobacco in the economy. Economic arguments play a vital role in public policy decisions. Hence, it is important to understand the economics of tobacco control. In this chapter we will quantify the impact of tobacco use on the economy and present economic arguments to regulate tobacco in a country with particular focus on the tobacco control environment in India.

2. Is Government Intervention Justified?

Before presenting various economic measures to regulate tobacco it is important to understand if government intervention to regulate the consumption and/or production of tobacco justified. The tobacco industry holds the view that regulating tobacco is an inefficient and unwarranted policy. The basis for such a position rests not only in a resistance to regulation, but also in the belief that tobacco users consume tobacco with full information about its health consequences, and that they take into account the costs and benefits associated with its consumption. In practice, however, neither do the tobacco users have full information of the possible health consequences of tobacco nor do they account for the external costs associated with its consumption.

The market for tobacco products is characterized by what is called "externalities" in economic parlance. An externality occurs when a person engages in an activity that influences the well-being of a bystander and yet neither pays nor receives any compensation for that effect. By definition, these externalities can be negative or positive. Cigarette smoking is a classic example of negative externality. A person exposed to the second-hand smoking has high risk of developing a variety of diseases, i.e., a negative well-being, for which they receive no compensation from the smoker. Second-hand smoking is, however, not the only form of externalities from tobacco. Deforestation resulting from the extensive use of wood in flue-curing tobacco, fire hazards from discarded cigarette and bidi ends, and the costs of cleaning cigarette and bidi litter and chewed tobacco spittle from public places are externalities too. Research on households in India has also uncovered evidence that spending on tobacco crowds out expenditures on food and education depriving a smoker's family members of their right to good food and education.[1] The consumption of tobacco thus entails a variety of costs that are often beyond the perception of smokers and they never compensate for the same. Externalities cause markets to be inefficient, and thus fail to maximize total surplus (societal benefit) in the economy. Negative externalities lead markets to produce a larger quantity than what is socially desirable while positive externalities would lead the markets to produce smaller quantity. In other words, there is a "market failure" in the market for tobacco products. Hence, as a corrective mechanism, economic theory suggests internalizing these externalities by way of altering incentives so that people take account of the external effects of their own actions. In case of negative externalities of smoking, for example, one such corrective mechanism could be an imposition of tax on cigarettes. Governments, working in the larger interest of the society, thus intervene in the markets of products such as tobacco which cause externalities and such intervention is warranted, desirable, and theoretically justified. Later in this chapter we would examine various ways the governments would intervene in the market for tobacco products and their potential consequences.

3. Tobacco Economy in India

Tobacco has a large presence in the Indian economy either through its wide-spread consumption or production. India is the second largest consumer and the third largest producer of tobacco in the world.[2] According to the Tobacco Board, under the Ministry of Commerce, GoI, which exists primarily for the development of tobacco growers and the Indian tobacco industry, tobacco provides employment directly and indirectly to 36 million people and contributed as much as Rs.19,891 crore as excise duty and Rs. 4,979 crore in foreign exchange to the national exchequer during 2012-13.[3] However, note that 36 million jobs are not full time equivalent jobs. National employment surveys by the National Sample Survey Organization (NSSO) place the direct and indirect tobacco workforce in India at approximately 7 million during 2004-05 which represent only 1.5% of the overall employment in the formal sector.[4] It is also estimated that about 3.42 million people are employed fulltime in bidi manufacturing in India in 2005-06 comprising about 0.74% of the total employment in India.[5] According to the Directorate General Systems and Data Management, Ministry of Finance, the excise tax collected from all tobacco products combined in 2013-14 amounted to Rs.18230 crores. To put this in perspective, it amounts to 10.8% of the total excise tax receipts and 1.6% of the gross tax receipts in that year. When it comes to the area under tobacco cultivation in India, tobacco is cultivated in an area of493,000 hectares and it is only 0.24% of the total arable land in India.[6] The total production amount to about 800 million kilograms out of which 265 million kilograms are flue-cured Virginia (FCV) tobacco that is produced in an area of 2.17 lakh hectares mainly in the states of Andhra Pradesh and Karnataka. Bidi tobacco is cultivated in an area of 1.02 lakh hectares, mostly in the states of Gujarat and Karnataka with an annual production of nearly 204 million kilograms.[7]

While tobacco in India contributes large amount of revenue and employment to the Indian economy in absolute terms, it is clear that its percentage contribution is relatively low. In other words the Indian economy is not heavily dependent on tobacco. However, the sheer size of tobacco consumption in India also leads to substantial costs to the nation (See Box 1 on estimating economic costs of tobacco).

According to a recent study, which considered all the three components of the costs above estimated that the total direct and indirect costs attributable to tobacco use from all diseases in India in the year 2011 amounted to a staggering Rs.1045 billion — 1.16% of the Gross Domestic Product and 12% more than the combined state and union health expenditures during 2011-12. As against this the

Box 1: Estimating Economic Costs of Tobacco

Definition of the costs of tobacco would largely depend on whether the costs are estimated for the individual or the society at large. Three major types of costs are typically considered while estimating the economic costs of tobacco: (1) direct medical cost of treating tobacco related diseases; (2) indirect morbidity costs; and (3) indirect mortality costs of premature deaths attributable to tobacco use. A variety of methods are employed to estimate different components of these costs. While some studies use prevalence based attributable risk approach and human capital methods to estimate these costs others use econometric methods.

The first two components of the costs above were estimated for four tobacco related diseases (tuberculosis, respiratory diseases, cardiovascular diseases and cancers) in India in 2004 to be Rs.109 billion.[10] Whereas, a more recent study, considered all the three components of the costs above and estimated that the total direct and indirect costs attributable to tobacco use from all diseases in India in the year 2011 amounted to Rs.1045 billion.[11]

total excise revenue from tobacco collected in 2011 was Rs.173.7 billion which amounted to just 17% of the total economic burden[8]. It is also estimated that spending on tobacco impoverishes about 15 million people in India.[9]

It is clear from the discussion that tobacco brings both benefits and costs to the Indian economy and it is important for policy makers to weigh these costs and benefits before it devices policies to regulate tobacco. Given that economic theory justifies regulating the market for tobacco it is important to discuss the ways in which the government can control the consumption and production of tobacco in India. The remaining discussion in this chapter will focus on this.

4. Demand for Tobacco

Demand for a product is the amount of that product a buyer is willing and able to purchase. Essentially, willingness and ability to purchase determine the demand. In other words, demand can be controlled by controlling the willingness and the ability to purchase of a consumer. Price and income are the most important determinants of ability to purchase. Willingness to purchase may be determined by a variety of variables such as price, availability of similar products (substitutes), the individual's taste and preferences, and the pleasure the person is expected to derive out of consumption. Hence, by controlling the determinants of demand, government can influence the quantity demanded of a commodity. Similar logic can be applied to tobacco products as well. There are a variety of demand side measures governments typically adopt to influence the demand for tobacco products.

Price is one of the most important determinant of demand as it can determine both the ability and willingness to purchase of a consumer. Evidence shows that increases in price of tobacco products can reduce both the consumption and prevalence of tobacco use by preventing initiation and uptake among young people, promoting cessation among current users and lowering consumption among those who continue to use.[12] Taxation is a tool that governments can use to effect the prices of tobacco products. But how increased taxation and thereby increased prices will affect the quantity demanded of tobacco products will depend on what is called the price elasticity of tobacco products. Price elasticity measures the percentage change in quantity demanded of cigarettes (or other tobacco products) due to a percent change in its price. In other words, it measures the price sensitivity of buyers. Let P1 and P2 be the initial price and new price of a pack of cigarettes. Let Q1 and Q2 be the quantity of cigarettes purchased at prices P1 and P2 respectively. Then, the price elasticity of demand for cigarettes (denotedε) is given by:

$$\varepsilon = \frac{(Q_2 - Q_1)/\frac{(Q_2+Q_1)}{2}}{(P_2 - P_1)/\frac{(P_2+P_1)}{2}} = \frac{(Q_2 - Q_1)}{(P_2 - P_1)} \times \frac{(P_2 + P_1)/2}{(Q_2 + Q_1)/2}$$

One of the fundamental laws in economics is the Law of Demand which states that other things remaining the same increase in the price of a product will lead to reduction in the quantity demanded of that product and vice versa. An example of cigarettes prices and quantity is given in Figure 1 which shows this inverse relationship.

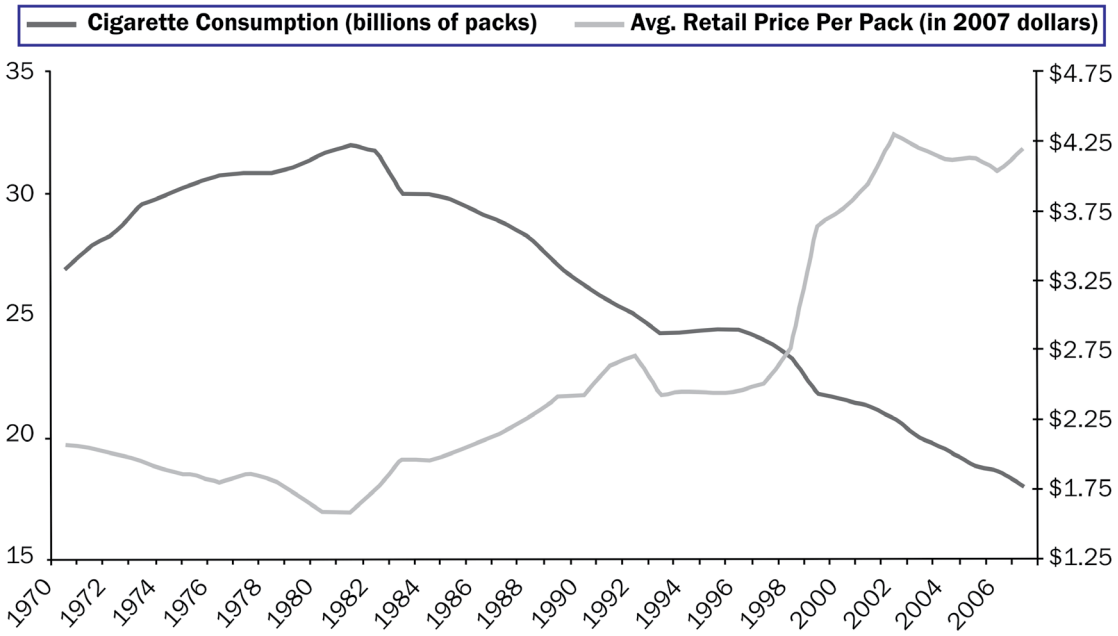

Figure 1: U.S. Cigarette Prices Vs. Consumptions 1970-2007

Sources: The Tax Burden on Tobacco, 2007; USDA Economic Research Service; U.S. Bureau of Labor Statistics.

Elasticity typically has a negative sign. If the absolute value of elasticity is less than one the product is considered relatively inelastic. If it is more than one it is said to be relatively elastic. The demand for most tobacco products are relatively inelastic. However, the price elasticity may vary from one population to the other depending on their characteristics. A World Bank review concluded that, all else being equal, price rises of about 10% would, on average, reduce tobacco consumption by about 4% in developed countries and about 8% in developing countries.[13] A recent review of the literature by the International Agency for Research on Cancer in 2011 finds that price elasticity range between –0.2 and –0.6 in developed countries.[14] In India, the price elasticities were estimated at -0.4 for cigarettes, -0.9 for bidis and -0.87 for leaf tobacco using data from the consumer expenditures surveys.[15] This means, in India, a 10% increase in the price of cigarettes would lead to a 4% reduction in its consumption. Refer to Table 1 to see the estimates for price elasticities for tobacco products in India.

Using the Global Youth Tobacco Survey (GYTS) price elasticities of participation (instead of quantity

Table 1: Price elasticity estimates for tobacco products in India

	Rural			Urban			Total		
	Bidis	Cigarettes	Leaf Tobacco	Bidis	Cigarettes	Leaf Tobacco	Bidis	Cigarettes	Leaf Tobacco
Bidis	-0.922*	-0.084*	-0.01	-0.855*	-0.063	0.011	-0.907*	-0.06*	-0.0002
	(0.043)	(0.029)	(0.009)	(0.084)	(0.093)	(0.01)	(0.037)	(0.026)	(0.006)
Cigarettes	-0.455*	-0.338**	0.021	-0.091	-0.196	-0.003	-0.204*	-0.348**	0.002
	(0.147)	(0.143)	(0.032)	(0.108)	(0.428)	(0.02)	(0.072)	(0.184)	(0.018)
Leaf Tobacco	-0.036	0.022	-0.871*	0.071	0	-0.874*	0.0002	0.013	-0.883*
	(0.035)	(0.025)	(0.018)	(0.068)	(0.119)	(0.029)	(0.028)	(0.029)	(0.014)

Source: (John et al. 2010)

*Notes: The elasticity in any given cell is an estimate of the effect of a percentage change in the price of the tobacco product in the corresponding column on the quantity demanded of the tobacco product in the corresponding row. Bold numbers are own-price elasticities. Values in parentheses are bootstrapped standard errors. Bootstrapping is a statistical method used to obtain confidence intervals when the underlying distribution of a particular computed estimate, like an elasticity, is not known, and yields estimates that can be compared to more familiar statistical distributions like the normal distribution. * and ** imply levels of statistical significance 1% and 5% respectively.*

demanded it examines the decision to use tobacco products despite the quantity consumed) for tobacco products were estimated for youths (13-15 years age) in India to be -2.7, -0.58, and -0.4 for bidis, gutka and cigarettes respectively.[16] It also found girls have significantly higher participation price elasticities than boys.

Evidence suggests that income growth and consumption of tobacco products are positively related leading to a positive income elasticity. Expenditures can be used as a proxy for income. Estimates of expenditure elasticities of tobacco products are 0.49 and 2.37 for bidis and cigarettes respectively in rural India. It means, for example, if income increases by 10% for rural household in India, their expenditures on bidis would increase by about 5%.Hence,while the demand for tobacco has an inverse (negative) relationship with prices it has a direct (positive) relationship with income. Expenditure elasticities for various tobacco products in rural and urban India are shown in Table 2.

Table 2: Expenditure elasticity estimates for tobacco products in India

	Bidis	Cigarettes	Leaf Tobacco
Rural	0.49	2.37	0.37
Urban	0.28	1.59	0.29

Source: (John 2008b)

Notes: The figures are estimates of the percentage change in the purchase of a particular tobacco product for a one percent increase in household expenditure.

The bottom line is that even though tobacco is an addictive product unlike most other commodities, it still responds to changes in prices and income. Hence governments can use price and income as important variables to control tobacco consumption. Taxation is an important tool through which the prices and income can be effected. It will be examined in more details later in this chapter.

Price and income are not the only factors affecting the demand for tobacco products. The factors that affect the tastes and preferences of consumers and their perceived utility from consumption can have far reaching effects on the demand for tobacco products. Control of advertising and promotion by tobacco companies, promotion of counter advertisement, and tobacco use restrictions at various locations such as work places and public places are all factors that can potentially influence perceptions about tobacco products which in turn affect their demand. These are commonly referred to as non-price measures for tobacco control. National Bureau of Economic Research, estimates that comprehensive set of tobacco advertising bans can reduce consumption by more than 6%.[17] Studies from India also show the desirable effects of comprehensive tobacco advertising bans on tobacco consumption.[18]

5. Supply of Tobacco

Supply of a product is the amount of that product a seller is willing and able to sell. But what the firms are able and willing to sell is not necessarily what they succeed in selling. One of the laws of economics, the Law of Supply, states that other things remaining same the quantity supplied of a product rises when the price of that product rises. Apart from the price of the product itself, the input prices, number of producers, prices of related goods, technology and productivity can all affect the supply of a product. Similar factors are in operation while determining the supply of tobacco products as well. Hence supply-side policies to regulate tobacco production and/or sale target these factors.

Government of India operates a Tobacco Board under the Ministry of Commerce primarily for the development of tobacco growers and the Indian tobacco industry. Government also gives several incentives for tobacco production and/or supply. Some of these include (1) minimum support prices for tobacco leaves which guarantee tobacco growers with a certain minimum price for their produce, (2) small producer exemptions for bidi manufactures which exempt bidi manufacturers producing less than 2 million bidis in a year from any taxation; and (3) bidi workers welfare fund to promote the welfare of persons engaged in bidi manufacturing. These are positive supply-side measures to promote tobacco industry.

When it comes to regulating tobacco, the supply-side issues that always come to the forefront are the employment of people dependent on tobacco. However, for the majority of countries, even the stringent tobacco-control policies will have either a minimal impact or no net impact on total employment, as money that would formerly have been spent on tobacco tends to be spent on other goods and services.[19] Even though the absolute number of people engaged in tobacco may look larger, tobacco farming constitutes a modest source of employment in most

countries and tobacco manufacturing employment constitutes well under 1% of total manufacturing employment in most countries.[20] In India the direct and indirect tobacco workforce represent only 1.5% of the overall employment in the formal sector. Only in West Bengal, Madhya Pradesh, and Jharkhand the bidi employment is more than 2% of the total employment.[21]

Restricting the import of tobacco is another supply-side measure to regulate the size of tobacco market in a country. However, such policies may be in conflict with international trade agreements and many countries may not want to resort to such measures. Access restrictions such as restricting the sale of tobacco products to minors, restricting the sale within certain locations such as in the proximity of educational institutions, inside bars/restaurants, and restricting sale of loose cigarettes are certain other supply side measures. However, the cost of implementing and enforcing these policies can be very high. Similarly, product or crop diversification is another supply-side measure that is usually proposed to gradually reduce the production and sale of tobacco. However, finding economically viable alternatives to tobacco farming and production may not be easy in several areas.

Other innovative proposals to regulate the supply of tobacco summarized by a recent study[22] include: (1) a regulated market model which proposes the transfer of marketing and distribution functions of tobacco suppliers to a monopoly with a mandate to 'service the existing market, but shape it to minimise harm'; (2) establishment of a 'non-profit enterprise with public health mandate', which would remove profit making from the entire tobacco supply system; (3) imposition of legal requirements on tobacco companies to reduce the number of people who use their products; (4) imposition of progressive limits on the amount of commercial tobacco released for legal sale; and (5) ban the sale and manufacture of cigarettes permitting smokers to grow their own tobacco.

Yet, one school of thought in economics does not favor proposals that call for a complete ban. According to it bans erode the essential concept of private property rights which is vital to wealth creation in a market economy. The Nobel Laureate Prof. Becker articulates some of the arguments against a ban as follows:[23] ban makes the product illegal and once the product is illegal, there will be direct monetary costs to tax payers to finance spending on police, court personnel used for trying users and traffickers, and guards and other resources spent on imprisoning and punishing those convicted on offences. Moreover, the users who continue to use banned substances may find it difficult to approach cessation programs due to the fear of being penalized.

Given high demand and the presence of alternative suppliers, supply-side policies are largely ineffective in comparison to demand-side policies to regulate tobacco. As long as there is demand there may be many people who would find it profitable to engage in trafficking of banned substances. In other words, smuggling and illicit trade in tobacco should very well be part of supply-side policies to regulate tobacco. In a nutshell, the most effective supply-side policy may be to focus on reducing the demand for tobacco, and to allow supply to respond to slow changes in demand.[24]

6. Taxation of Tobacco in India

Research from around the world shows that tobacco taxes and price increases are effective in reducing tobacco use by promoting cessation among current users, deterring young people from taking up tobacco use, and reducing how much continuing users consume.[25] Taxation is one of the most important price measures to regulate the consumption of tobacco. Tobacco products may attract both consumption taxes and customs duties. Customs duties are import duties (a certain percentage on the value of the import) whereas consumption taxes can take the form of either excise taxes or retail sale taxes (or value added taxes (VAT)). Excise taxes are levied at the stage of production itself whereas VAT is applied at various stages of the distribution chain including at the final sale. Excise taxes can be of three kinds: (1) pure specific tax which is a tax per unit of production; (2) pure ad valorem tax which is tax on the value of the product; and (3) mixed tax which is a combination of both specific and ad valorem taxes. There are advantages and disadvantages to each type of taxes. Please see the Table 3.

Specific tax is recommended for tobacco to achieve health objectives.[26] However, while many countries rely on specific taxes, there are a large number of countries who use either ad valorem or mixed taxes to tax tobacco products. The WHO recommends setting tobacco excise taxes to be at least 70% of the retail prices.

Table 3: Specific vs. Ad Valorem Taxes

	Specific Taxes	Ad Valorem Taxes
Merits	Easier to administer Easier to determine the amount of tax Ensure stable tax revenues Tend to rise prices Better impact on tobacco use	Inflation does not erode the real value Reduces industry profit
Demerits	Real value may be eroded by inflation Tax may be reduced by changing product characteristics	Difficult to administer Difficult to determine the amount of taxes Less predictable tax revenue Tend to reduce prices Leads to larger price differences between products Relatively lower impact on tobacco use

Source: (Chaloupka et al. 2012)

The structure of tobacco taxation is complex in India where financial powers are divided between the center and the states. While the central government enjoys the power to impose central excise duties on tobacco products the state governments have the power to impose sales tax. The present central excise duties on various tobacco products (financial year 2015-16) are given in Table 4.

As one can see, there are huge discrepancies in excise taxes across various tobacco products in India. Cigarettes in India are taxed based on their lengths and there are several tiers of cigarettes for the purposes of taxation with excise duties varying vastly between them. This enables tobacco companies to engage in manipulation and tax avoidance. While excise tax rates for cigarettes are large those of bidis

Table 4: Central Excise Duties on tobacco products in India in 2015-16

DESCRIPTION		BED	NCCD	Health Cess	Total	Basic Customs Duty (%)
Cigarettes & Bidis (Rate / Rs. Per 1000 Sticks) (Specific Taxes)	Cigar & Cheroots	12% or Rs.3375 whichever is higher	-	-	12% or Rs.3375 whichever is higher	60%
	Non Filter <65mm	1280	90	70	1440	30%
	Non Filter 65mm-70mm	2335	145	110	2590	30%
	Filter <65mm	1280	90	70	1440	30%
	Filter 65mm-70mm	1740	90	70	1900	30%
	Filter 70mm-75mm	2335	145	110	2590	30%
	Other cigarettes	3375	235	180	3790	30%
	Handmade Bidis	10	1	5	16	30%
	Machine made Bidis	21	2	5	28	30%
Other Tobacco Products Ad Valorem Taxes	Chewing tobacco	70%	10%	6%	86%	30%
	Pan Masala containing tobacco Gutkha	60%	10%	6%	76%	150%
	Preparations containing chewing tobacco	60%	10%	6%	76%	30%
	Jarda Scented tobacco	70%	10%	6%	86%	30%
	Smoking mixtures for pipes or cigarettes	360%	45%	6%	411%	30%

BED: Basic excise duty; NCCD: National Calamity Contingent Duty
Source: Ministry of Finance, Government of India

are extremely low. Hand-made bidis, which constitute more than 98% of the bidis produced in India attract an excise tax of only Rs.16 per 1000 sticks while the lowest taxed cigarettes has an excise tax of Rs.1280 per thousand sticks. Both bidis and cigarettes attract specific excise duties whereas most of the smokeless tobacco products attract an excise duty of 76%. Even though an ad valorem tax is imposed on most of the chewing tobacco products it should be noted that the type of taxation that is followed for this product is also referred to as presumptive taxation or compounded levy. Under this, the manufacturer of these products pays duty on the basis of a normative assessment of production (computed based on the capacity and maximum speed of installed packing machines in his factory) and not the actual production he declares. It should be also noted that the excise duties also got various components (See Box 2). Thus one can say that Govt. of India is following a mixed taxation strategy for various tobacco products.

Tobacco products also attract VAT which varies from 50% in Rajasthan to 12.5% in Chandigarh. Even within states VAT rates vary between different tobacco products with zero VAT for bidis in certain states. This difference of VAT rates across states potentially encourages inter-state smuggling and tax evasion. The proposed Goods and Services Tax (GST), to be rolled out from 2016 is expected to bring uniformity in VAT rates across states. Inclusion of all tobacco products in GST, is expected to mitigate many anomalies with the existing tobacco taxation structure. However, along with GST, all tobacco products should also have a uniform additional duty of excise.

Given that demand for tobacco is positively related to income and negatively related to prices it is important that a good taxation system on tobacco is adjusted for inflation as well as income growth to make it progressively unaffordable so that the consumption diminishes overtime. Affordability is a concept that captures the interaction between consumer's income level and tobacco prices.[27] The data show that over the past several years, bidis and cigarettes have become more affordable as indicated by an increasing affordability index in Figure 2.

Bidis are nearly three times more affordable in 2011 than they were in 1990, while cigarettes are about 175% more affordable. The affordability here is measured as GDP per capita relative to the wholesale price index for bidis and cigarettes.[28] Given that both bidis and cigarettes attract specific taxes in India, the increases in specific taxes effected for these products over the past several years were obviously not enough. This is, in fact, one of the disadvantages of specific taxes.

Taxation of tobacco can simultaneously achieve the dual purposes of decreasing consumption as well as increasing tax revenue (see Box 3). Given that tobacco products are relatively price inelastic, smaller increases in taxes may result in reduced consumption yet increased consumer expenditures on tobacco. Since households only have fixed budget to spend, increased expenditures on tobacco means reduction in expenditures on something else. The item that is likely to be sacrificed could potentially be important items of consumption for other family members. Studies from India, in fact, show that expenditures on tobacco crowds out expenditures on education and milk for children, and clean cooking fuel.[29] Hence, what is required is very large increases in taxes to the extent it decreases consumer expenditures on tobacco products. The fact that tobacco companies themselves increase the prices more than the increases in taxes every year should be seen as an indication that the actual tax increases could be even more.

The existing tobacco tax revenue is highly skewed with nearly 85% of revenue coming from cigarettes alone while it accounts for only 15% of the tobacco consumption in India.[30] It was also found that Bidi

Box 2: Components of Excise Taxes in India

Excise duties for tobacco products in India has several components: (1) Basic Excise Duty: imposed on all products except salt manufactured in the country as per the Central Excise Act of 1944; (2) National Calamity Contingent Duty (NCCD): an earmarked tax introduced in 2001 used for calamity relief in various states; (3) Health Cess: Also known as an additional duty of excise introduced in 2005 to provide resources for the various programs under the National Rural Health Mission (NRHM); and (4) Education Cess: an additional Cess calculated on the aggregate of all duties of excise (including special duty of excise or any other duty of excise but excluding Education Cess on excisable goods). All excisable goods are exempted from this as on 2015-16 union budget.

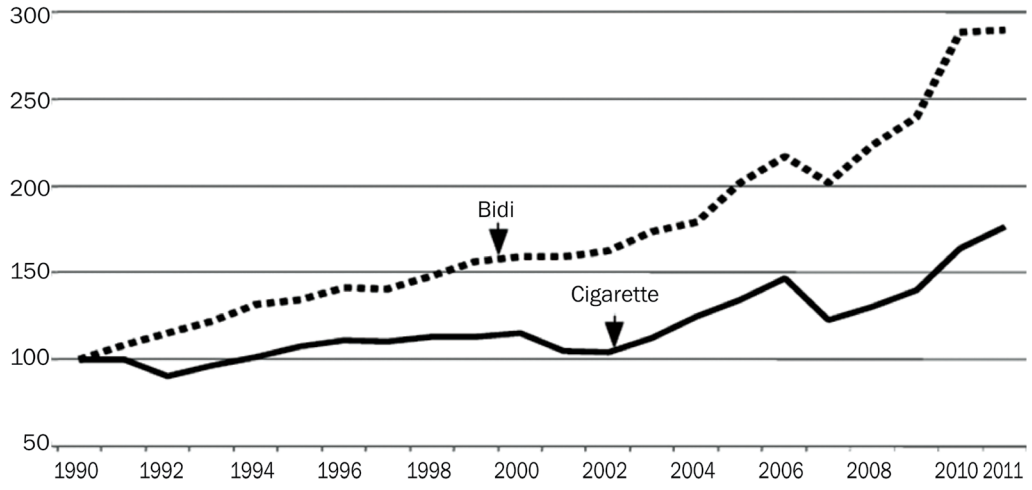

Figure 2: Affordability of tobacco products in India

Source: (Jha et al. 2011)

Note: A rising affordability index indicates tobacco products are becoming more affordable

Box 3: Impact of increasing taxes on bidis on consumption, expenditures and Government Revenue

Using price elasticity of bidis estimated as -0.91 the authors here[32] have estimated the impact of increasing taxes on bidis on consumption, expenditures and government revenues. The table below is adapted from their study. At 0% tax it shows the current price of bidis along with the consumption, expenditures and tax revenue. Taxes are increased in the multiples of 20% initially followed by very large increases. One can see that for every increase in taxation of bidis until 600% increase, the consumption keeps falling and tax revenue keeps rising. At 600% taxes the tax revenue reaches its maximum beyond which increases in taxes reduces the revenue. Consumer expenditure rises initially for smaller increases in taxes whereas it starts falling with larger tax increases. Such large percentage increases in tax on bidis is warranted due to the extremely low current taxes on bidis. The message here is that substantial increases in taxes are required in order to see fall in consumer expenditures. With smaller increases in taxes, the consumers would divert their expenditures from other items of consumption into tobacco consumption thereby depriving family members of their consumption needs. It also shows that tobacco taxation is a double-edged sword which achieves the dual purpose of consumption reduction as well as increases in tax revenue.

Tax Increase	Unit Price (Rs.)	Tax rate (% of retail price)	Tax per stick	Consumption (Billion Sticks)	Expenditure (Bidi consumption in Billion Rs)	Tax Revenue (Billion Rs.)
0%	0.159	9%	0.014	1000	159.1	14.0
20%	0.162	10%	0.017	984	159.3	16.5
40%	0.165	12%	0.020	968	159.4	19.0
60%	0.167	13%	0.022	952	159.4	21.3
80%	0.17	15%	0.025	936	159.4	23.6
100%	0.173	16%	0.028	920	159.2	25.8
200%	0.187	22%	0.042	840	157.1	35.3
400%	0.215	33%	0.070	680	146.2	47.6
600%	0.243	40%	0.098	520	126.3	51.0
620%	0.246	41%	0.101	504	123.8	50.8

industry's economic contribution is small relative to the disproportionately large public health damage from bidi smoking.[31] An argument in favor of lower taxes on bidis is regressivity of existing taxation of tobacco. According to this as most of the bidi smoking is concentrated among lower-income people, tax burden would disproportionately fall on poor. However, it should be noted that large concentration of bidi smoking would also result in disproportionate disease burden among poor on account of tobacco use. Moreover, even though existing taxes may be regressive it does not mean the tax increases will be regressive as well. This is because the evidence shows that lower-income people are more price responsive to tobacco than higher-income people. As a result, tax increases will result in larger decline of consumption among poor than among rich resulting in relatively smaller burden of tax increases on poor compared to rich. Moreover, some of the tobacco tax revenues could be earmarked towards programs targeting poor which will mitigate the effects of disproportionate tax burden on poor to some extent.[33]

Tobacco is a demerit good and the tax on it is referred to as sin tax. Hence, tobacco taxation should have the ultimate goal of controlling tobacco consumption and safeguarding public health than anything else. Given that bidi is the most widely consumed tobacco product in India and thereby imposing the largest economic burden on the country there is no reason why bidi should be attracting the least of taxes. What is imperative is a tobacco taxation policy that taxes all tobacco products uniformly and one that makes the tobacco products more and more unaffordable over the years adjusting for income growth and inflation while making sure that excise tax component constitutes at least 70% of the retail price of these products, if not more.

Summary

Economic arguments play an important role in public policy decisions with respect to regulating tobacco. Hence, it is important to understand the economics of tobacco control. Even though tobacco generates plenty of employment opportunities and bring in lot of tax revenues the nation is not depended on it as the employment it generates is less than 1% of the manufacturing employment and the tax revenue it brings is only 1.6% of the gross tax revenue in India. Moreover, it was also observed that the economic costs of tobacco amounted to a staggering Rs.1045 billion in 2011 which was 12% more than the combined state and union health expenditures and 5 times more than the excise tax revenue collected from tobacco. Economic theory provides justification for the intervention of government in the market for tobacco products given the huge externalities tobacco generates.

Given that the demand for tobacco products respond to changes in price and income, several price measures can be used to regulate the consumption of tobacco. Tax is the most important price measure to regulate tobacco and is effective in reducing tobacco use by promoting cessation among current users, deterring young people from taking up tobacco use, and reducing how much continuing users consume. Several of the supply-side measures to reduce tobacco are not as effective as demand-side measures.

India follows a mixed taxation system for tobacco products with cigarettes and bidis attracting a specific taxation while many of the smokeless tobacco products have ad valorem taxes. However, the current rates of taxes do not make the tobacco products sufficiently unaffordable. Moreover, bidis which are consumed

Box 4: A novel initiative- mCessation

Ministry of Health & Family Welfare, in partnership with World Health Organisation and the International Telecommunications Union, has started an initiative for utilising mobile technology for tobacco cessation. WHO-ITU's 'Be Healthy Be Mobile' initiative, aims to reach out to tobacco users of all categories who want to quit tobacco use and support them towards successful quitting through constant text messaging on mobile phones. The initiative is supported by the Government of India.

The interested individual can register online or through a missed call. The person receives a series of messages which tells them about the important reasons for quitting and prepares them for a total quit day. It supports them through the quitting process through motivational messages and specific tips. The sms messages are supported along with web-based information on reasons to quit, making a quit plan, tips to sleep better, how to manage craving, 10 easy ways to get support and how to manage craving

more commonly attract a tax that is negligible thus undermining the public health goal of tobacco taxation. Additionally, in situations where tobacco companies increase the prices of their products more than the increases in taxes, governments should be able to increase the taxes even more. Smaller increments in taxation can potentially crowed out expenditures on other essential items of household consumption. For an effective tobacco taxation policy, the government should find ways to tax different tobacco products uniformly at a rate above 70% of their retail prices and commit to increase it regularly to make it more and more unaffordable over time. Keeping a tag on the illicit tobacco trade is also instrumental in sustaining an effective taxation and tobacco control strategy.

Unit Review Questions

1. Is controlling tobacco products by the governments justified? If so how and what are some of the price and non-price measures to control the market for tobacco?
2. What is affordability and how can a taxation system be designed to make the tobacco products more unaffordable?
3. What are the advantages and disadvantages of different types of taxes and which type of taxes are better for tobacco control?
4. What is easier - Controlling the demand for tobacco or the supply of tobacco and why?

Application question (s)/ Assignment

The current consumption of cigarettes in India is approximately 6 billion packets of 20 sticks each. The price of an average pack of cigarettes is Rs.30 which includes a tax of Rs.13 per pack. The government wants to increase the tax on cigarettes by 50% from the current Rs.13 to Rs.19.5 per pack but would like to know whether it will lead to lose of tax revenue or affect consumption. You are advising the government on this matter. You know that cigarettes have a price elasticity of -0.4 in India. What will you advise the government about the possible impact of this tax increase? In particular estimate the following: (HINT: Assume that the entire tax increase would be translated to price increase)

a) The impact on consumption of cigarettes due to the proposed tax increase
b) The impact on the consumer expenditures on cigarettes
c) The impact on government tax revenue

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CHAPTER 14

TOBACCO INDUSTRY INTERFERENCE AND PUBLIC HEALTH

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Identify common tactics used by the tobacco industry which impinge upon public health
2. Understand the guidelines on protection of public health policies from vested interests of tobacco industry
3. Become aware of legal provisions to implement FCTC Article 5.3 at national and state level to neutralize tobacco industry interference

KEYWORDS

FCTC Article 5.3, public health, tobacco industry, tobacco control,

1. Introduction

Tobacco industry is a lethal industry. It is a well-recognised fact that more than half the lifelong users of tobacco will die prematurely from tobacco-related diseases. Urgent action needs to be taken as specified under the provision of the WHO's Framework Convention on Tobacco Control (FCTC). So far, 180 nations (including the European Union) have agreed to work together to reverse the impact of the tobacco use epidemic. However tobacco control efforts are systematically opposed by the tobacco industry. Some of the common strategies used by tobacco industry include:

1. Manipulating the political and legislative process
2. Overplaying the employment and economic importance of the tobacco sector
3. Gaining public support by looking respectable
4. Creating front groups to show support for tobacco industry
5. Discrediting scientific evidence
6. Intimidating and threatening governments with litigation

1.1 Manipulating the political and legislative process

The tobacco industry is highly resourceful and is therefore able to undermine governments' efforts to protect public health. Through personal and political favours, monetary or otherwise, tobacco industry is adept in deflecting and diluting policies that impact tobacco use. For long, tobacco companies were part of the policy making process, but this needs to change. Tobacco industry has created and exploited legislative loopholes and lobbied with policy makers to make favourable laws that advance tobacco use.

Example from India: India's largest cigarette maker, Indian Tobacco Company (ITC) had disclosed that it had given donations to all major political parties in India. Such political donations are made towards making favourable policies, and not for public good.[1]

In South-East Asia region, The Philippines' Tobacco Regulation Act gives the tobacco industry a seat in Government's Inter-Agency Committee on Tobacco (IACT).[2] The governments of Indonesia and Malaysia accept, endorse or consider legislation drafted by or in collaboration with the tobacco industry.[3]

1.2 Overplaying the employment and economic importance of the tobacco sector

Tobacco industry usually makes up figures ,contrary to the facts, on employment, tax contributions and other economic indicators to show that their products contribute significantly to the local and national economy. Industry also ignores the social, environmental and health costs caused by tobacco and tobacco products while presenting these numbers.

Whereas the fact economic cost for diseases attributable to tobacco use in adults in India for the year 2011, was estimated to be 1,04,500 crores (US$ 22.4 billion).[4] Also Expenditures on tobacco consumption 'crowd out' spending on food and education among households in India.[5]

In term of employment, the bidi industry has made claims that tobacco control efforts would push millions of poor and marginalised families into abject poverty and destitution. Such numbers are hard to come by, but the recent household survey by the Telangana government shows that these are often exaggerated. The survey found that there were only 1.70 lakh beedi workers in Telangana, but the figure claimed by the industry or their allies is nearly 5 lakh. (see Deccan Chronicle www.deccanchronicle.com/150320/nation-current-affairs/article/telangana-links-welfare-schemes-intensive-household-survey)

1.3 Gaining public support by looking respectable

Tobacco is a nefarious industry. The tobacco industry has developed a range of tricks to manipulate public opinion and in turn influence policy makers. By investing funds in youth programmes or unrelated social causes, such as disaster relief and nature conservation groups, tobacco companies shift the focus away from their deadly products and gain a veneer of social respectability. Often these are rewarded.

At the Rio+20 Summit, the UNDP awarded India's largest cigarette maker, ITC with the highest global award for protecting the environment. This is far from true, because where ever tobacco is grown, forests disappear. (see: The curious case of tobacco companies and eco prizes: http://www.dnaindia.com/analysis/column_the-curious-case-of-tobacco-companies-and-eco-prizes_1715496).

Tobacco companies have in recent years increased their CSR spending in the ASEAN region. Philip Morris International (PMI), for example, increased its charitable spending in 6 countries in the ASEAN region from US$8.2 million in 2009[6] to US $10.2 million in 2012.[7] In the Philippines and Thailand, PMI more than doubled its spending, while in Malaysia it increased its CSR expenses by five-fold[8]

1.4 Creating front groups to show support for tobacco industry

One of the common industry strategies is to use 'front groups' to voice its opposition to healthier policies. Tobacco industry pays huge sums of money to government, politicians and political parties, media houses, celebrities and civil society to simulate support. The tobacco industry cultivates support by setting up grassroots groups and support their interests like conservation and environment, health and rural development. Such groups focus on individual freedom, and try to deceive the public of the exaggerated claims of death and ill health from tobacco use.

Prominent civil society organisations that have received funding from and partner with tobacco companies include WWF, The Energy Research Institute (TERI) and Confederation of Indian Industry (CII).

1.5 Discrediting scientific evidence

Sowing the seeds of doubt on the scientific evidence about the harm caused by tobacco and second-hand smoke is a popular tactic used by the tobacco industry. In order to weaken tobacco control legislation, the industry sparks controversy to distract and confuse the public and governments, and often uses politicians and policymakers to voice their views. Although these are small in numbers yet they are a potent subset of this community leads the world in vehement denial of the dangers of tobacco use.

In April 2015, Government of India's Parliamentary Committee on Subordinate Legislation recommended to delay the implementation of larger pictorial health warning by stating that there are no evidence from India which establishes tobacco causes cancer and it is harmful for human health. It was later discovered that two members of the Committee had vested interest in tobacco industry.

1.6 Intimidating and threatening governments with litigation

Threat of legal action is a popular tactic to intimidate governments that introduce effective tobacco control policies.

In December 2014, the smokeless tobacco industry had challenged the order of the Government of Bihar in Patna High Court which proposed a ban on smokeless tobacco sale and got the stay order. The state government took the matter to the Supreme Court of India where Supreme Court overturned.

2. History of tobacco industry interference in India

India has a long history of tobacco industry interference in public policy and public health per se. The Government of India perversely benefits from tobacco industry directly (as it receives taxes from the industry and provides incentives to farmers through the Tobacco Board of India and the industry) and indirectly (it invests funds in tobacco sector through insurance and pension funds). In March 2015, the case of tobacco industry came out in the public when members of parliament with vested interests were made to decide on pictorial health warnings and other tobacco control policies. The Government of India (and states) benefit from the growth in tobacco sector, and therefore stands liable for supporting the tobacco epidemic, which currently kills in excess of 1.2 million adults every year.

3. Provisions that protect public health policies from tobacco industry interference

The World Health Organization – Framework Convention on Tobacco Control (WHO–FCTC) is the first global health treaty negotiated under the auspices of WHO. This convention is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. The FCTC was developed in response to the globalization of the tobacco epidemic which is facilitated through a complex and competing factors which have domestic and cross-border impacts like trade liberalization and global marketing by transnational tobacco, and their use of advertising, promotion and sponsorship, their role in international trafficking of counterfeit cigarettes and other tobacco products to name a few.

The FCTC entered into force on 27 February. India spearheaded regionally and globally in FCTC negotiations. India's leadership was demonstrated when a comprehensive Cigarettes and Other Tobacco Products Act (COTPA) was enacted by Government of India on 18 May 2003, before the World Health Assembly adopted the WHO FCTC on 21 May 2003. This Act encompasses most of the FCTC provisions. Some tobacco control advocates have however been circumspect about this claim, stating that the tobacco industry in India was keen to get the legislation passed which did not fully comply with the global best practices that the FCTC guidelines which were to be written subsequently.

Having ratified the WHO FCTC on 5 February 2004, India is a party to the convention and has to implement all provisions of this international treaty. One critical aspect of the FCTC was to exclude tobacco industry from influencing policy making and in implementation of tobacco control law. To this end, Articles 3 and 5 of the FCTC (and specifically Article 5.3) mandate Parties to establish a national coordinating mechanism or focal points for tobacco control; and implement effective legislative, executive, and /or other measures for tobacco control as part of the General Obligations of the Treaty. Article 5.3 emphasises for the "protection of public health policies with respect to tobacco control from commercial and other vested interests of the tobacco industry".

For clarity, it is important to define tobacco industry. The tobacco industry comprises those persons and companies engaged in the growth, preparation for sale, shipment, advertisement, and distribution of tobacco and tobacco-related products, and those which invest into or receive investments from tobacco industry.

3.1 Elements and functional aspects of Article 5.3

Subsequent to the main text of the FCTC, Guiding Principles were presented which reason why tobacco industry needs to be excluded from participating in public health policy. The Guiding Principles state:

Principle 1: There is a fundamental and irreconcilable conflict between the tobacco industry's interests and public health policy interests.

Principle 2: Parties, when dealing with the tobacco industry or those working to further its interests, should be accountable and transparent.

Principle 3: Parties should require the tobacco industry and those working to further its interests to operate and act in a manner that is accountable and transparent.

Principle 4: Because their products are lethal, the tobacco industry should not be granted incentives to establish or run their businesses.

Subsequent to Principles, the Parties agreed on Recommendation which become obligatory upon Parties who signed and ratified the treaty, which includes India. The FCTC Article 5.3 guideline's recommendations are:

- Raise awareness about the addictive and harmful nature of tobacco products and about tobacco industry interference with Parties' tobacco control policies.
- Establish measures to limit interactions with the tobacco industry and ensure the transparency of those interactions that occur.
- Reject partnerships and non-binding or non-enforceable agreements with the tobacco industry.
- Avoid conflicts of interest for government officials and employees.
- Require that information provided by the tobacco industry be transparent and accurate.
- De-normalize and, to the extent possible, regulate activities described as "socially responsible" by the tobacco industry, including but not limited to activities described as "corporate social responsibility".
- Do not give preferential treatment to the tobacco industry.
- Treat State-owned tobacco industry in the same way as any other tobacco industry.

3.2 Legal provisions to implement Article 5.3 at national and state level

As a party of WHO-FCTC, the Union Government is mandated to creating a national policy which is in line with the principles of FCTC Article 5.3. Supporting the FCTC, Section 2 of COTPA states 'It is hereby declared that it is expedient in the public interest that the Union should take under its control the tobacco industry". However, should the Union Government takes its course, and any state sees an urgency to come out with such a policy, then there are constitutional rights and other legal powers wrested with states to do so. Under 7th Schedule of the Constitution of India, health is listed as a state subject. By stating that the tobacco epidemic is a public health emergency, a state can pass a legislation that complies with provisions of Article 5.3 of the FCTC. In many instances states have taken steps to implement international treaties before national legislation or policy was framed including policies on biodiversity, environment, human rights, child labour, rights of women, etc.

The most important is the judgement passed by The Hon'ble Supreme Court of India in Vishaka Vs. State of Rajasthan and others, 1997 (case no. 6 SCC 241) which stated that "Any International Convention not inconsistent with the fundamental rights and in harmony with its spirit must be read into these provisions to enlarge the meaning and content thereof, to promote the object of the constitutional guarantee." Following Vishaka judgement, the Supreme Court in Apparel Export Promotion Council vs. A.K. Chopra, 1999 (case no. 1 SCC 759) observed that "international instruments cast an obligation on India and the courts are under an obligation to give due regard to international conventions and norms for construing domestic laws".

In sum, states can take the lead in formulating policies that protect its public health policies from tobacco industry interference.

3.3 Steps towards implementing Article 5.3

At national and state level, it is important for administrators to take the following steps:

1. Develop a model code of conduct and clear policy document that aligns with the Principles of FCTC Article 5.3 through a consultative process, and one which excludes the tobacco industry. The policy should include three parts: the objective of the policy, a model code of conduct for all government employees (and their contractors and agencies) and conflict of interest declaration.
2. Review and develop elements that make an effective national (or sub-national) laws, policies and implementation guidelines.
3. Identify a lead agency that will monitor and alert in case of any breach on the policy and code.
4. Develop a mechanism for engagement of policy discussions with tobacco industry, which is done through the participation of broad stakeholders engaged in tobacco control. Only a few departments (revenue, industry, labour) should be permitted to meet the tobacco industry, and this to should be conducted under the oversight of the ombudsman appointment by the Government and key tobacco control stakeholders.
5. Identify steps needed at national and state-level to take to implement effective steps to curb tobacco industry interference and carry out systematic monitoring of the tobacco industry, including documentation

4. The role of public health professional

Public health professionals should lead by example and strive towards advocating for their departments or institutions from engaging with tobacco industry. A clear policy (code of conduct and conflict of interest declaration by every staff) which conforms to FCTC Article 5.3 is a starting point. Public health professionals should also monitor tobacco industry interference and activities and report these to concerned local authorities. From a global perspective, multilateral organisations like United Nations and bilateral organisations are also vulnerable to the manipulation of tobacco industry and their front groups, and it is important to monitor the activities of the industry, government and global development agencies. Public health professionals can analyse and document practices and publish these in open access, peer-reviewed journals and propagate findings through earned media (newspapers, websites and others).

Summary

Tobacco industry uses ingenious ways to neutralise tobacco control efforts. Health professionals can use existing provisions in national laws to overcome any such efforts. This chapter summarises some common tactics used by the tobacco industry and a few examples of how these can be mitigated.

Unit Review Questions

1. Why is it important to anticipate and address tobacco industry interference?
2. Mention three commonly used tactics of tobacco industry in India, and suggest ways in which these can be mitigated?
3. Which tactic of the tobacco industry is currently not addressed under national law? How can this be addressed?

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Suggested Readings

The FCTC Article 5.3 Toolkit: Guidance for Governments on Preventing Tobacco Industry Interference http://www.theunion.org/what-we-do/publications/technical/the-fctc-article-5-3-toolkit-guidance-for-governments-on-preventing-tobacco-industry-interference

Legacy Tobacco Documents Library website (http://legacy.library.ucsf.edu/)

SEATCA (http://industryinterference.seatca.org/wordpress/)

Movies depicting tobacco industry strategies

1. The Insider (http://www.imdb.com/title/tt0140352/?ref_=fn_al_tt_1)
2. Thank you for smoking (http://www.imdb.com/title/tt0427944/?ref_=nv_sr_1)
3. Complicity of tobacco industry in recent pack warnings (April 2015), see: http://www.ndtv.com/video/player/the-buck-stops-here/an-oncologist-and-cancer-survivor-s-message-to-squabbling-netas-i-m-the-proof/362590

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CHAPTER 15

MULTI-SECTORAL APPROACH IN TOBACCO CONTROL

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Illustrate the potential of multi-sectoral approach in tobacco control
2. Describe and appraise the main arguments around effectiveness of multi-sectoral approach in tobacco control

KEYWORDS

Inter-sectoral coordination, multi-sectoral coordination, tobacco control, tobacco control India

1. Tobacco Control- A Multi-sectoral and Multi-stakeholder Issue

World Health Organization (WHO), since its inception recognized the importance of multi-sectoral action in health protection and included this aspect in its constitution. The concern on tobacco is reflected by adoption of resolutions by World Health Assembly on national and international tobacco control measures.[(1)] Comprehensive tobacco control is only possible through a holistic approach involving different sectors. The holistic approach consists of proven demand and supply reduction strategies which in turn include treating tobacco addiction by providing services to help tobacco users quit tobacco.[(2)] Preventive and promotive measures such as health education as well as the application of a legal–policy framework such as prohibition on sale of tobacco products to minors are some of the measures that support demand and supply reduction for tobacco products respectively. The key elements for tobacco control recommended by World Health Assembly for comprehensive tobacco control programs include measures from various sectors, such as, health, finance & treasury, customs & excise, trade & commerce, consumer affairs, agriculture, external affairs & international trade, law & justice, labour, transport & public service, education, environment, defense, culture & sports, and religion.[(3)] The guiding principles of Framework Convention on Tobacco Control (FCTC) emphasized upon comprehensive multi-sectoral measures and responses to reduce consumption of all tobacco products at the national, regional and international levels.[(4)] In 2004, the Government ratified the WHO Framework Convention on Tobacco Control[(5)], which enlists key strategies for reduction in demand and reduction in supply of tobacco through inter-sectoral coordination. Some of the demand reduction strategies include price and tax measures and non-price measures such as statutory warnings, comprehensive ban on advertisements, promotion and sponsorship, tobacco product regulation etc. The supply reduction strategies include combating illicit trade, providing alternative livelihood to tobacco farmers and workers and regulating sale to and by minors.[(6)]

2. Global Initiatives for Multi-sectoral Approach for Tobacco Control

There have been collaborative efforts between different sectors on tobacco control. Educational efforts through mass media are an excellent example of multi-sectoral activity for tobacco control. In some developed countries, no other health topic has received consistent and diverse media coverage.[7] Centre for Disease Control (CDC), Tips From Former Smokers (Tips) campaign, the first federally funded, nationwide, paid-media tobacco education campaign in the United States is an example of this approach. The first Tips campaign featured former smokers talking about their experiences and their families' experiences living with diseases caused by smoking and second hand smoke exposure. In addition to a comprehensive earned media component, the Tips campaign included advertising on national and local television, local radio, online media, and billboards as well as in movie theaters, transit venues, and print media. A subsequent evaluation of Tips found that an estimated 1.6 million smokers attempted to quit smoking because of the campaign and that more than 100,000 of them would likely quit smoking permanently.[8]

Multi-sectoral approach was adopted in Bangladesh by a Non-Governmental Organization (NGO) called Policy Research for Development Alternatives (UBINIG). It has conducted extensive crop substitution research projects/initiatives. Since 2009, this project has helped over 500 farmers shift from tobacco to food production by partnering with an NGO. This movement was led by farming communities practicing biodiversity-based ecological agriculture. A major component of the crop substitution initiative centered on mixed cropping, crop rotation, and no pesticides, herbicides or chemical fertilizers.[9]

Legislation and policy initiatives require a special mention. Its role cuts across most of the strategies for tobacco control. Through appropriate legislation, it can not only control tobacco usage by the community, but also would indicate the policy direction of the government and creates a positive social environment for tobacco control. For example, the New York Tobacco Control Program runs statewide media campaigns, develops and executes policy and regulatory initiatives, implements enforcement efforts, and funds organizations across the state to work in five modalities: community partnerships for tobacco control, youth action programs, school policy programs, cessation centers, and colleges for change programs. All community programs are charged with bringing about environmental change in multiple settings, including work sites, schools, licensed tobacco retailers and public spaces. These community actions complement and reinforce similar state wide action through three types of activities: use of paid and earned media to raise awareness and educate the community and key community members about the tobacco epidemic; education of government policy makers about the tobacco epidemic to build support for tobacco control policies; and education of organizational decision makers, including tobacco retailers, healthcare organizations, school boards, and community organizations, for policy changes and resolutions.[10]

3. Multi-sectoral and Inter-sectoral Collaboration in Tobacco Control –Indian Perspective

Although the important role of sectors other than health has been realized for a long time, the tobacco control has largely been restricted to a public health initiative. This has resulted in a complex relationship and dependence between the tobacco growers, processors, product manufacturers, transporters, traders, advertising agencies, users and the regulatory authorities like agriculture experts, and governments. India faces a conflict of objectives of various sectors connected with tobacco. While health sector tried various modalities for tobacco control, tobacco manufacturers adopted various measures for promotion of tobacco use, often with active support of sectors other than health. The lobbying by tobacco industry has resulted in conflict between objectives of different sectors connected with tobacco. Inter-ministerial coordination is paramount for effective implementation of various regulatory and fiscal measures. For example, taxation of tobacco products, which is an effective tobacco control policy, requires advocacy with and cooperation of the finance and commerce ministries. Such ministries must recognize the links between tobacco use and poverty and the role that tobacco control can play in poverty alleviation. Similarly, education ministries must recognize the important role of education in reducing tobacco use.

The different sectors and their role in tobacco control are as follows:

3.1 Agriculture

Agriculture sector in India resists major tobacco control initiatives. The Directorate of Tobacco Development, in collaboration with State Departments of Agriculture, primarily aims at planning, coordinating and supervising development and marketing programs of tobacco at national level. The Indian Tobacco Development Council, constituted in 1966, serves as an advisory body for this purpose. This Directorate is implementing programs on production and distribution of pure seeds and seedlings of tobacco, and on training in improved methods of tobacco cultivation to the farmers. The Central Tobacco Research Institute is conducting research on improving the yield and quality of tobacco. A multi-centre project by Indian Council of Agricultural Research helps in agronomy, plant breeding, soil chemistry entomology and plant pathology, as related to tobacco. The main functions of Tobacco Board, constituted in 1976 are, regulation of production of Virginia tobacco, ensuring fair and remunerative prices to the growers, maintenance & improvement of existing markets, and development of new markets for Indian tobacco outside the country.[11] However, Ministry of Health & Family Welfare led a research project on alternate crops to tobacco (chewing, bidi and hookah tobacco), which was undertaken in collaboration with Ministry of Agriculture through the Central Tobacco Research Institute (CTRI), Rajahmundry, Andhra Pradesh. The preliminary results submitted by the institute have encouraging findings in terms of the possibility of economically viable options for alternate crops.[12]

Apart from Agriculture, labour sector points out the prospect of millions of bidi rollers loosing their job due to major tobacco control actions, the upheaval in unemployment among farmers is expressed by agriculture sector, and the prospect of reduced revenue in slow economic conditions is not considered practical by the financial sector.

3.2 Commerce and Industry

Government of India established the Tobacco Board to regulate production, promotion of overseas marketing and to control recurring instances of imbalances in supply and demand, which led to market problems. The Tobacco Board Act aims at the planned development of Tobacco Industry in the country. The activity of the Board includes the regulation of production and curing of Virginia Tobacco with regard to the demand in India and abroad (Ministry of commerce and industry).

3.3 Education

The education system has been optimally utilized to spread information, shape attitudes and strengthen skills as relevant to tobacco control. Realizing the potential of educational institutions, the Indian Council of Medical Research (ICMR) carried out a research project in Goa, from 1986 to 1992, on anti-tobacco community education through school children.

The project tested the feasibility and efficacy of educating school children in empowering them for non-initiation of tobacco use and the effect of this education on the tobacco use prevalence in the community, through children-parent interaction. The overall reduction in the prevalence of tobacco usage among men was 11.8% & 13.4% in two experimental areas and 2.0% in control area. Decrease in prevalence of tobacco use among women was 9.1% and 13.3% in two experimental areas and 10.2% in control area.[13]

3.4 Legislation

Legislation forms the foundation of successful tobacco control activity.[14] Legislation serves specific social objectives: It helps to raise, recognize, reinforce, reassess, reach, and reconcile certain societal values. The major impetus for a multi-sectoral approach for tobacco control started in 1995, with submission of the 22nd Report of the Indian Parliament's Committee on Subordinate Legislation. The committee made wide-ranging recommendations and called upon the medical, scientific, and legal sectors to collaboratively form a national level nodal agency for the comprehensive control of tobacco[15]. It also called for engaging parliamentarians and policy makers in creating a favourable climate for effective legislation for smokeless tobacco laws and policies.

Comprehensive tobacco control in India requires the collaborative efforts of both the Central Government and the states. The implementation of the National Tobacco Control Law, 2003, is the responsibility of the State Governments. Some states have not only formulated strong, independent laws to address specific components of tobacco control strategy, but have also used existing laws like the Cigarettes and Other Tobacco Products Act, 2003 (COTPA) and other laws to curb smokeless tobacco use in their respective states. COTPA, an amended version of

the draft bill of 2001, completed its passage through Parliament on 30 April 2003 and was assented to by the President of India on 18 May 2003 (Parliament of India, 2001). The states of Tamil Nadu, Andhra Pradesh, Maharashtra, Goa, and Bihar have banned the use of smokeless forms of tobacco such as gutka and pan masala. These practices are good examples of the partnerships between various ministries as well as the Central and State Governments, who came together to formulate and implement legislation to curb the smokeless tobacco epidemic. It is important to note here that many of these legislations would not have been possible without the activism of civil society advocates and dynamic partnerships between health and developmental programmes. Evidence provided by these groups in the form of studies, anecdotes, case studies, media briefings has been instrumental in stimulating legislative bodies and policy makers to formulate and enact acts to tackle the menace of smokeless tobacco.

3.5 Health

The tobacco control goal of health systems change is to increase health care providers' intervention with patients who use tobacco. World Health Organization has called for tobacco cessation to be integrated into health care[16]. Health Service Providers are well placed to use patient's visit as an opportunity for providing screening and brief interventions in tobacco cessation. Brief intervention has been recommended as a best practice for the management of tobacco dependence in clinical settings. Because majority of tobacco users visit a physician each year, the clinical setting is an important channel for motivating smokers to quit and for delivering evidence-based cessation treatments.

3.6 Media

It has been well established that awareness and advocacy related to tobacco avoidance and control prevents or reduces tobacco use. Typically, effective health communication and awareness interventions and counter-marketing strategies employ a wide range of paid and earned media, including: television, radio, print, and digital advertising at the state and local levels[17]. A major success in multi-sectoral approach for tobacco control was the collaborative project between ICMR and All India Radio, the state owned and only radio network in India. The acronym DATE stood for Drugs, Alcohol, and Tobacco Education. The radio program was in the form of 30 weekly episodes of 20 minutes each. The surveys showed that the potential listeners of radio comprised 80.4% of the population in Goa and 59.1% of the population in

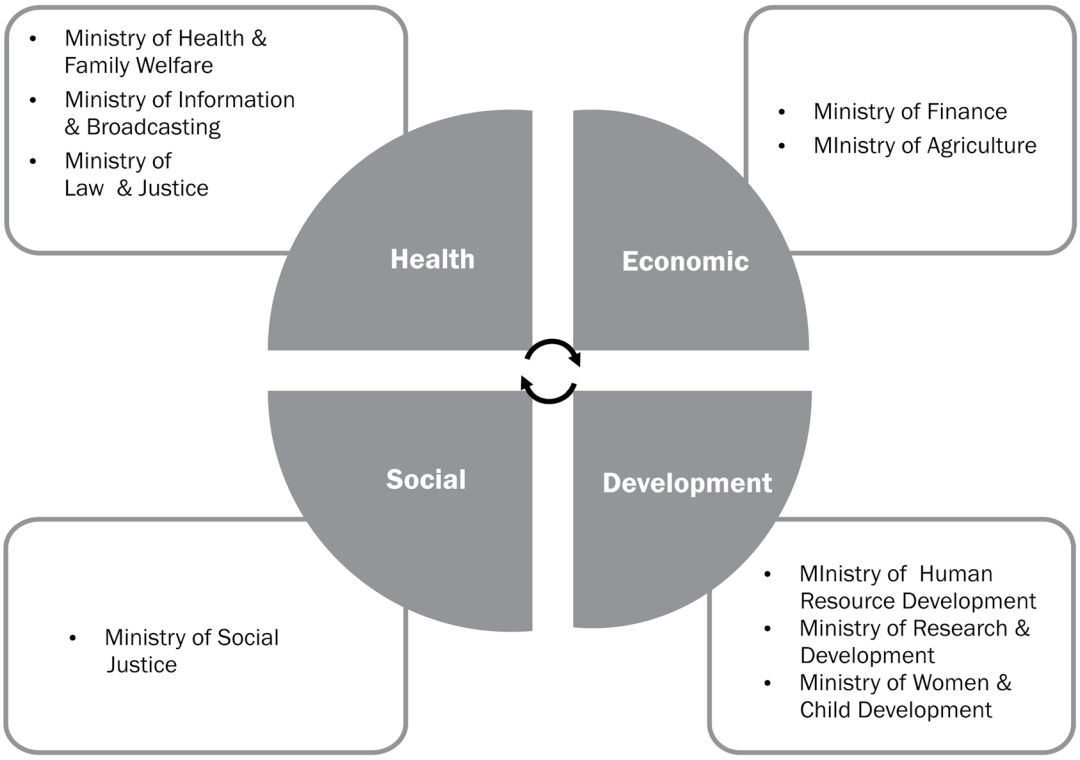

Figure 1: Multi-sectoral Collaboration in Tobacco Control

Karnataka. About 4% tobacco users in Goa and about 6% users in Karnataka quit their habit after hearing the program[18]

3.7 Finance & Taxation

Price of tobacco products vis-a-vis the income level of the community is one of the major factors influencing the extent of its use by the society. Relative variations in the price of tobacco products through increase in taxation or through changes in paying capacity of the people has one of the clearest and most immediate influences on tobacco use. In many societies, the price elasticity of demand for cigarettes by the adult population is around –0.5, i.e. a tax rise which increases the price by 10% is likely to reduce smoking by 5%. However, taxation rate on other tobacco products would also determine if sensitive people are likely to quit tobacco use or they may shift to other related products. This suggests that increased taxation would be a good modality for tobacco control.

3.8 Civil Society Groups

The WHO FCTC recognizes the importance of participation of civil society to achieve the goal of reducing tobacco-related morbidity and mortality[19]. Civil society groups are valuable resources for steering and strengthening the components of tobacco control program. Over the past two decades, their high level of motivation and commitment has been in ample evidence and led to the enactment of a strong law for tobacco control as well as India's support to the Framework Convention on Tobacco Control. Champions in the civil society sector have initiated many judicial interventions through litigation, and advocated for a tobacco-free society. For e.g. Advocacy Forum for Tobacco Control (AFTC) is a coalition of organizations and individuals working in the areas of advocacy, awareness and research related to tobacco control in India. The AFTC members include public health experts, health professionals, research scientists and officers from Indian NGOs. The main goal of the AFTC is to work in a coordinated manner on tobacco control advocacy at the national and regional levels. It also consolidates opinion on implementation of tobacco control policies among general public and key stakeholders through policy related research. Tobacco control efforts are being monitored at the grassroots level through the formation of local volunteer groups. Panchayats (elected bodies of

Table 1: Role of Different Departments in Tobacco Control

Departments	Role in Tobacco Control
Department of Health and Family Welfare	◆ Nodal agency for implementation of COTPA ◆ Regular awareness activities by District Task Force ◆ Implementation, and review of National Tobacco Control Program ◆ Fund (through NHM) policy oriented research on tobacco control ◆ Handle toll free no 104 for reporting COTPA violations ◆ Counselling of Tobacco/Nicotine addicts at Counselling centers
Department of Police	◆ Direct state police heads to enforce all the provisions under COTPA/FSSAI#/Drugs and Cosmetics Act/Poison Act (against nicotine). ◆ Regular collection of COTPA violation related data and upload on their official website ◆ Regular review of COTPA implementation in the monthly crime review meetings
Department of Education	◆ Installation of signage on the wall of all Educational Institutes stating "NO Tobacco Usage within 100 yards". ◆ Implementation of tobacco-free school guidelines in all schools ◆ Make all Educational Institutes 'tobacco-free premises' ◆ Inclusion of harmful effects of tobacco use in the school curriculum ◆ Regular sensitization activities for students and teachers (role plays, pledge or brief talk during assembly etc.)
Department of Finance	◆ Increasing VAT on all Tobacco products including bidis to at-least 75% as per WHO Guidelines to reduce overall prevalence and increase the age of initiation

Departments	Role in Tobacco Control
Department of Labour	◆ Ensure that all tobacco products manufactured in registered factories print the pictorial health warnings ◆ Underage boys/ girls are not employed in bidi industries
Department of Transport	◆ All public transport vehicles to be smoke free / tobacco- free ◆ No direct/indirect advertisement or promotional activities related of tobacco products on state transport bus panels and its premises. Rather, displaying of anti-tobacco messages on bus panels, bus stands, bus tickets etc.
Voluntary Organizations	◆ Integrate tobacco control in all the ongoing interventions ◆ Monitor violations of tobacco control laws and bring them to the notice of authorities/steering committee ◆ Collaborate with State Government/Local Government on awareness generation ◆ Work with local communities (Panchayati Raj Institutions and Urban Local Bodies) to create awareness against tobacco use and strengthen the implementation of COTPA
Department of Law, Justice, and Legislative Affairs	◆ Advise the state level committee on legal issues pertaining to implementation of COTPA/FSSAI/Drugs and Cosmetics Act ◆ Hold special seminars /workshops with judges and advocates so that the tobacco related litigations are prioritized
Academic and Research Institutes	◆ Undertake research by lead institutions in tobacco control for informed decision making by policy makers ◆ To do advocacy wherever possible for tobacco endgame
# Food Standard and Safety Authority of India	

government operating at the village level) are raising social awareness and mobilizing their communities against the ills of tobacco. In 2011 and 2012 many such village committees banned sales of tobacco (including gutka) in an attempt to make their villages tobacco free.

Summary

Effective tobacco control involves coordination of various sectors. By leveraging the strengths and varied approaches of partners, effective multi-sectoral coordination can eliminate policy implementation barriers, facilitate scale-up, and increase the impact of individual sectors. Coordination across government ministries, for example, is essential for identifying intersections among the sectors and identifying opportunities for collaborative planning. Successful multi-sectoral collaboration in tobacco control is dependent on political, economic, and social factors and requires buy-in and commitment from all sectors and ministries working together. Multi-sectoral approach for tobacco control is the need of the time and deserves utmost consideration.

Unit Review Questions

1. Define multi-sectoral coordination. Enlist the sectors involved in tobacco control.
2. Discuss some global initiatives on multi-sectoral coordination in tobacco control.

Application question/ Assignment

1. Discuss the roles of the different sectors involved in tobacco control. How well do these sectors collaborate? What areas of collaboration need to be improved? What improvements do you recommend?
2. What are the challenges and dilemmas of multi-sectoral approach in tobacco control?
3. How multi-sectoral coordination leads to effective implementation of tobacco control policy and program? Explain with example (case study)

Case Study 1 –India
Identifying common responsibilities for tobacco control: the WHO Framework Convention for Tobacco Control in India*

The estimated number of adult tobacco users in India is 274.9 million, with 206 million users of only smokeless tobacco. The myriad ways in which tobacco is produced, marketed and consumed further adds to the complexities of tobacco control. This case study describes how multi-sectoral action for health has contributed to the implementation of the WHO Framework Convention on Tobacco Control (WHO FCTC) in India and thereby offers insights for Health in All Policies.

The WHO FCTC, ratified by the Government of India in 2004, provides the foundation to manage tobacco control programmes and request the cooperation of related sectors. A high-level governance structure the National Tobacco Control Cell, was created and established in the Ministry of Health and Family Welfare in collaboration with WHO Country Office for India for overall policy formulation, planning, monitoring and evaluation of the different activities envisaged under the programme. Every State has a State Tobacco Control Cell, which is responsible for planning, implementation and monitoring at State level. To drive the implementation of the WHO FCTC by different sectors, high level coordination committees have been established at national, state and district levels.

The Ministries that have contributed towards tobacco control at national and state level include: Ministry of Human Resource Development, Ministry of Information and Broadcasting, Ministry of Home Affairs, Ministry of Labour, Ministry of Railways and Ministry of Finance. In addition Parliament, judiciary, civil society and media have also been significant allies for the advancement of tobacco control in India. Preliminary work is underway with the Ministry of Agriculture, Ministry of Labour, Department of Rural Development and Ministry of Environment and Forest for working out strategies to provide alternative livelihoods for those engaged in bidi rolling, tendu leaf plucking and tobacco cultivation.

The experience of the Tobacco Control programme with intersectoral action was that challenges like low levels of involvement of other Ministries and the perception that “tobacco control is the mandate of the Ministry of Health alone”, needed to be addressed. They are being addressed through advancing mechanisms for advocacy and dialogue with stakeholders, including training. Sensitization and training workshops on key topics are held regularly to help multisectoral stakeholders/ministries understand their role and how to implement the provisions of WHO FCTC. Detailed guidelines have been developed to further help all programme implementers and law enforcers, regardless of sector or level of government.

Through the various processes described above, India has been able to achieve varying levels of compliance on most of the key provisions of WHO FCTC and MPOWER package. New policy initiatives have come into force on prohibition on sale of tobacco to minors and around educational institutions, imposing restrictions on tobacco imagery in films and TV programmes and ban on smokeless tobacco products like gutka (chewed tobacco). Some states, cities and villages have come forward and declared their jurisdictions as smoke-free and tobacco-free. The continued roll-out of and enforcement of these new initiatives will continue to rely on cooperation and collaboration across sectors, as well as the different levels of government, supported by appropriate advocacy and training.

Case Study 2 - Bhutan
Implementing Tobacco Control Policy and Gross National Happiness audits in Bhutan: existing, vital mechanisms for Health in All Policies*

The Royal Government of Bhutan (RGOB) accords a high priority to the promotion of health and happiness of its population through the model of Gross National Happiness (GNH). The government integrates the GNH values into all of the national policy-making processes. The concept of "Health in All Policies" (HiAP) is fairly new to the Bhutanese policy-makers and planners, including those in the Ministry of Health. However, a multi-sectoral approach, implemented through inter- multi-sectoral committees or task forces platforms, involving actors from civil society, consumer groups and academia, is an mechanism that is being used. Using this platform, enables health to seek support from other sectors, and to make necessary decision in the process of policy development. The Tobacco Control Board is an example. It was created in Bhutan, where a Board comprises of 13 members representing different governmental and other agencies.

The context to this case is the increasing political will that emerged in Bhutan to improve tobacco control. The Ministry of Health played a leading role since the 1980s in providing information to public and other sectors to reduce and control tobacco use. However, when the multi-sectoral committee was established in the 1990s at the national and district levels, other sectors were invited to support better cooperation and interactions with the MOH. Subsequently, in 2004 and 2005, the sale of tobacco was banned and smoke-free areas designated, success of which was invariably attributed to multi-sectoral efforts, rather than health alone. The Tobacco Control Act of Bhutan was brought in 2010. It played a crucial role in empowering the enforcement and response of agencies, enabling them to carry out their responsibilities without fear or ambiguity. Multi- sectoral action is evident in the enforcement of tobacco control policy whereby the measures of reducing tobacco use in the country are integrated into the plans of other sectors. Community leaders and district officers also play a crucial role in monitoring tobacco control measures. This range of multi-sectoral actions may have contributed positively towards reducing tobacco consumption and maintaining low prevalence rates of tobacco use in Bhutan, thereby effectively helping with compliance with the provisions of the WHO FCTC. The case study clearly demonstrated the feasibility of using multi-sectoral mechanisms in policy development and the gains from improving the efficiency of cooperation and coordination between sectors.

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CHAPTER 16

ROLE OF CIVIL SOCIETY IN TOBACCO CONTROL

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. understand advocacy in tobacco control
2. learn Key strategies /tools to be used for the purpose of advocacy
3. comprehend the role of media in advocacy initiatives

KEYWORDS

Advocacy, civil society, tobacco

1. Introduction

The tobacco epidemic is one of the most serious and fastest growing global public health problems today. In the Indian context, it is equivalent to the mythological rakshasa Ravana, with his 10 heads, denoting the various forms of deadly tobacco products. This demon has to be fought using multi-pronged strategic weapons. Two actions. the sentence should be in plural. civil society advocacy and action are the primary foundations. on which all tobacco control campaigns rest. Advocates of tobacco control through their successes and failures have learnt some hard lessons. Across the world, civil society and public health advocates have worked towards ground-breaking policies, legislations and their enforcements.

2. Why civil society role is important in any tobacco control effort

The Tobacco industry has literally waged a war with public health over last many decades. The dimensions of the issue are such that Governments with their limited human resources and outreach capacities cannot be the lone drivers of tobacco control. Civil society organizations are crucial partners or legitimizers during policy formulations to ensure that the laws or sub-laws get passed. They are watchdogs and whistle blowers to monitor implementation of various provisions of the Act. They can also have a role

to play in the effective implementation of the law by key stakeholders, such as the hospitality sector. They can report violations and file public interest litigations to resist the tobacco industry's deceptive tactics or exert necessary pressure on the government to pass policies or laws in public interest. This chapter makes a modest attempt to discuss civil society roles and strategies that have brought about far-reaching impact in public health and tobacco control.

3. Civil Society Advocacy

In India, the tobacco control movement has evolved since the 1980s,in the absence of any comprehensive legislation or resources to work on the issue. A few like-minded organizations which formed the Action for Tobacco Control Network (AFTC) in 2001 were pioneers of the civil society campaign against tobacco with little else except a strong will.

Advocacy is the most important tool used by civil society for any campaign. It basically means gaining or eliciting support or endorsement of a policy, a public interest issue or a cause from a specific target audience such as Parliamentarians, media or the public. Effective advocacy can help create a new law, build public opinion in favour or disfavour of a new policy; strengthen existing laws, enlist media support and bring about profound impact.

Tobacco control advocacy in a country such as India has not been easy as public opinion is not yet very strong and the tobacco lobby has a lot of influence on governments. Creating public opinion and political will by building support and working with the media are the keys to effective advocacy. All three are linked and often overlap. Political will cannot be created without public support and public support is built by gradually increasing awareness through media support.

4. Policy Advocacy

Traditionally civil society has been viewed as anti-establishment and activists are thought to be critical of the Government. However, times have changed and in tobacco control policy advocacy, the civil society's role has broadened considerably to include public health experts, researchers and legal activists who have given rich contribution[2]. The government is also a strong ally as it has the sole mechanisms to control tobacco use and promotion through strong laws, higher taxes and health promotion policies. Advocacy with the government and garnering the support of Parliamentarians and policy makers is therefore of primary importance.

4.1 Policy-focused research for creating tools

This is the first step where detailed research is conducted on a particular issue or policy, and the information from available studies and reports is gathered and condensed into user-friendly briefs or tools for the target audience. Advocacy that is research-based goes a long way and these can be evidence-based policy briefs, supporting documents that include results of a public opinion poll conducted

Early Initiatives by Civil Society[1]:

- 1988 : Establishment of the first tobacco control network - ACTION comprising doctors, NGOs, scientists and researchers for knowledge sharing and country-wide campaigns.
- 1988-89 : School campaigns across India in Delhi, Gwalior, Varanasi, Guwahati, Patna and other cities.
- 1990 : Radio Date initiative by AFTC with support from Indian Council of Medical Research (ICMR) and All India Radio (AIR) to broadcast a series of radio programmes on health promotion and substance abuse to reach the youth across India.
- 1991 : Civil society members nominated on the Steering Committee of the first national conference on Tobacco by Ministry of Health and Family Welfare (MOHFW) to main stream tobacco as a public health issue.
- 1993-1997: Awareness campaigns in schools across India, dissemination of information and education materials to NGOs and public health institutions.

by a reputed agency, important facts obtained through Right to Information (RTI), or a special research study/ report packaged attractively.

- **Right to Information as a Tool in Advocacy:** Right to Information is a powerful tool in tobacco control advocacy. Under the RTI Act 2005, authentic information from Government sources can be collected by civil society organizations or any Indian citizen filing carefully worded questions in the form of applications to which responses are mandatory within 30 days. The basic objective of the Right to Information Act is to empower the citizens, promote transparency accountability in the working of the Government, contain corruption, and make our democracy work for the people in the real sense. It enables citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority.

Under RTI, civil society organizations can:

- Ask the government, public offices and institutions for information that can expose inaction, arbitrariness, corruption and address grievances.
- Demand most types of information such as photocopies of representation, programmes, budget, copies of letter sent to states etc.
- Demand status of requests or complaints filed, demand an explanation from the government for their action /inaction.

4.2 Consultative meeting of key stakeholders

It is a good strategy to hold a consultation meeting where all stakeholders can join and discuss the issues together, develop a joint strategy and give suggestions that can feed into the representations/petitions or appeals by civil society. These can be presented to Member of Parliaments (MPs) and policymakers along with well-researched reports, facts and figures on the key issues.

4.3 Gaining support of Parliamentarians and policymakers

Parliamentarians are busy people handling specific areas like health, commerce, finance, etc. Messages that are tailored for their interests and concerns are more effective. They need to know that tobacco control measures such as raising taxes will not have a negative economic effect, affect livelihoods or create a sudden drop in industry sales or government revenues. Some parliamentarians may like to hear what opinion polls have to say, before finalizing a policy.

- **Representations, petitions and appeals:** Representations or petitions are more effective if signed by 3-4 reputed civil society organizations representing different sections of society.

In Rajasthan, RTIs were filed by Rajasthan Voluntary Health Association with the State Transport Corporation in 2008 on why state transport buses did not have smoke free signages. After the RTI, the Rajasthan State Road Transport Corporation issued orders for installing smoke free signages in all 5000 RSRTC buses and issued direction to drivers and conductors that no passengers be allowed to smoke in public transport vehicles. In Delhi, Voluntary Health Association of India (VHAI) filed an RTI in with the MoHFW to get copies of the minutes of the Group of Ministers (GoM) in 2008 on the issue of pack warnings. The first RTI application was rejected on the ground that the matter was pending so information was not shared. Later, VHAI again filed the same RTI and got a copy of the minutes of all the 6 GoM meetings - the information was effectively used in policy and media advocacy on the implementation of the pack warnings for the first time in India in 2009.

A case in point is the study titled, "Tobacco use in Bollywood Movies, Tobacco Promotional Activities and Their Association with Tobacco Use Among Indian Adolescents"[3], in 2011, which revealed some significant findings that concluded that, smoking scenes in movies and TV films and receptivity to tobacco promotional activities were both independently associated with every tobacco use among adolescents. This information was conveyed to the Ministry of Information and Broadcasting by civil society through effective messages while advocating for Smoking in Films Rules in 2012.

These can include a global level public health organization, a cancer hospital, a group of doctors or public health specialists and a national level voluntary organization. A letter or appeal can also be sent by a network of civil society organizations representing women's groups, educational institutions, etc.

- **Sensitization of Members of Parliament, Members of the Legislative Assemblies and bureaucrats:** A round table can be organized by civil society to sensitize groups of MPs and MLAs on key issues. This is quite effective, saves time and can open windows of opportunities for follow-up with one-to-one meetings.

5. Building Public Opinion for Advocacy

If an important legislation meets roadblocks, does not get notified in time or does not get implemented, quick action should be taken in the form of gaining public support. The better informed the public, the stronger the support. The public should also be made aware of the aspects of the legislation, or for instance in this case smoke free laws - the harmful effects of second-hand smoke and the rights of non-smokers. There are several methods by which surveys, signature campaigns, meetings, public education mechanisms through schools and colleges and the media can be used to sensitize and mobilize the public and to check the degree of enforcement and violations.

- **Public displays such as a rally, public meeting** addressed by a celebrity, a human chain or candle light vigil involving a large number of well-known persons of social repute and general public can work for public and media as well as for policymakers.
- **Soliciting for formal declarations in front of a large public audience** can help in building support and exerting pressure on the district/ state administration to give commitment on the issue. By declaring Budgam as first "Smoke Free District" of Jammu and Kashmir State on 26th January 2012, the State Government demonstrated commitment towards safeguarding the health of the people of the state. Such visible announcements sometimes ensure that policymakers and officials pursue its implementation and enforcement.
- **Tailoring messages for the public:** Messages for the public need to be designed to remove ignorance, a casual attitude and skepticism about the dangers of tobacco use. An example of this is the misuse of the concept of personal choice, something constantly propagated by the tobacco industry. Some people think of smoking ban as an imposition on their personal freedom even though they may agree that tobacco is harmful. Civil society must take care to see that their messages are simple, clear,evidence-based and have an emotional concept. It is also important to keep in mind that the public is more likely to listen to respected doctors, scientists, teachers, religious leaders, celebrities, sports figures, TV and movie stars and artists.

6. Media Advocacy

The media is an essential partner for creating political will, educating and building public support. Given its potential as a channel of influence, advocacy with media can give rise to significant policy changes that prioritize strategic efforts towards tobacco control. Realizing this, public health and tobacco control advocates in India, are beginning to successfully befriend and use the media to influence how the public and policymakers attend to and prioritize tobacco-related issues. Civil society's successful engagement with the media has in recent times proved that it can be a game changer in giving visibility to an issue and building favourable public opinion.

- Sensitizing print, electronic and online media: Civil society organizations should work actively to sensitize and seek support from print, electronic and online media - newspapers, magazines, radio and TV channels. Media advocacy works in two ways – with policymakers and with the public. For the former, the national and local pages, and editorial pages of the largest dailies and the primetime news on credible TV channels are important. For the public, the headlines and the front pages of newspapers and primetime news, plus popular talk shows and discussion forums are good mediums. One should not underestimate the power of the radio in today's times. Both in urban as well as rural communities, the radio has tremendous reach. An example has been VHAI's 93.5 Red FM Radio Campaign in 2010-2011 on the occasion of World No Tobacco Day. Short crisp messages on the hazards of tobacco played repeatedly on the channel during the week reaching many people across the cities of Delhi and Jaipur.

Civil society must research on media and identify the key correspondents, reporters or feature writers who are covering health issues. Journalists have to be cultivated. One cannot just call up a newspaper or TV channel and ask them to write on a piece or cover an event. It is essential to keep in touch with media persons even in non-campaign times by having informal chats, writing appreciative letters to them on other issues that they are writing on.

- **Strategic involvement of media:** An important campaign can be kicked off by calling a press conference at a central venue easily accessible to the press such as the Press Club and sharing a detailed press kit, which contains the press release, key fact sheets and supporting evidences. The dates and timings of the press meet are essential so that it does not clash with an important political event or weekend/holidays when the press is busy with feature stories.
- **Timely information to media:** The media should be sounded in advance about important forthcoming campaigns, public rallies or demonstrations for direct coverage of the issue. An event or cause is more likely to get wide coverage if attended by a well known parliamentarian, celebrity, prominent social leader or even a sports or film star.
- **Open editorials/letters** to editors of newspapers, as also meeting with editors in person can also result in greater highlighting of the issue.
- **Media partnership:** An exclusive media partnership with a prominent daily on an issue or campaign is also useful. This way one newspaper or TV channel is promised exclusive news, which can appear in a phased manner, This can also be tied up to an important milestone or tobacco free week. An example is the news coverage on the Delhi toxic air quality, which was being covered daily by Times of India during the week, June 1-5 2015.
- **Involving regional media:** It is equally important to network with the regional language media for an important campaign to build public and policy support at state level. In Kottayam, Kerala, this proved extremely effective to keep media interest in the campaign alive and gradually build public support.

7. Legal Advocacy

Judicial activism has resulted in several landmark judgments in areas of public interest in India. The Indian judiciary adopted the innovative practice of Public Interest Litigation (PIL) in the 1970s wherein any individual or organization can approach the court seeking intervention on a matter of public interest. Tobacco as an issue has featured in many court cases in India as a result of campaigns and initiative from civil society groups as well as affected consumers. Path-breaking judgements have been given by the judiciary in public interest. But litigations are a laborious, resource-oriented and time consuming process. Civil society needs to persevere and be willing to do hard work in terms of devising legal strategies, selecting the right legal counsel, provide the right facts and information to defend the case and attend court hearings. Everybody cannot fight legal battles. Still, it is a powerful option in the face of continuing hurdles posed by the tobacco lobby. A successfully-contested PIL has considerable significance by way of wide spread awareness, media publicity, and can go a long way in bringing about changes in existing norms and policies.

Civil society has been at the forefront in the legal advocacy on tobacco control in India for many years now. There have been several game-changing legal cases, such as freeing Indian sports from the clutches of the tobacco industry, getting effective pictorial health warnings implemented on tobacco products,

Two cases in point are:

- The visit of a senior journalist to Kottayam from Outlook (Hindi) to do a feature on Smoke free Kottayam in 2009 under the PAT & APPLE Project between VHAI and the The Union, was a milestone in creating a wider platform for the effort.
- An Air Quality Monitoring (AQM) study undertaken by VHAI in 2009[4] provided substantive data on air quality in public places like restaurants and bars. The study and the wide media coverage received in India helped strengthen the Smoke-Free Advocacy Campaign for smoke free settings. The media was very interested as this was the first study of its type in India.

In 1999, VHAI filed a petition with the High Court of Delhi seeking a ban on the sponsorship of Indian Cricket by WILLS Brands of cigarettes, manufactured by ITC. The Court directed the Union government, also a respondent in this case, to file an affidavit. The Government stated that a Bill had been recently introduced in the Parliament, proposing a ban on all forms of direct and indirect advertising of tobacco. After a long battle, ITC voluntarily withdrew sponsorship of Indian Cricket Team in 2001. This litigation paved the way for tobacco-free Indian sports. This was one of the earliest victories for civil society, following which the Government of India passed the Cigarettes and Other Tobacco Products Act (COTPA) in 2003.

banning point of sale advertisements, gutka ban and many more cases where public health organizations and activists are seeking judicial intervention, for advancing tobacco control measures.

8. Civil society Role in Cessation Interventions and Giving a Voice to Tobacco Victims

As tobacco is an addictive product, cessation interventions or support measures to encourage and help people quit tobacco use are essential. Since the Government has limited resources and clinical settings are few in number with limited health professionals, civil society action in the area of cessation is required pro-actively. Local community-based organizations and trained counselors have in the last few years used non-clinical, behavioural methods of counsellings to help communities quit tobacco use. Among rural and difficult to reach populations, intensive small group sessions by civil society groups, on quitting tobacco use have been found to be quite effective. Notable examples are cessation efforts on use of smokeless tobacco among disadvantaged women, where interventions consisted of workshop sessions, counsellings and follow-ups.[5] Results showed that groups of men and women were able to abstain and gradually quit tobacco use. Civil society has also helped develop a special manual to guide community health workers in tobacco cessation counsellings under the National Tobacco Control Programme (NTCP).[6]

More recently, civil society has also contributed to the voices of tobacco victims being brought to a wider platform up to the policy level. The Voices of Tobacco Victims (VoTV) has managed to sensitize Parliamentarians, policymakers, media and the public and, thereby, create considerable awareness about the consequences of tobacco use and the hardships faced by cancer survivors and their families. The health specialists/doctors who have treated the patients are also part of the platform, to provide scientific backing to the victims' statements. In 2011, VoTV along with other civil society organizations sensitized former Leader of the Opposition, Mrs Sushma Swaraj along with 40 MPs at an event in New Delhi, which received wide media coverage and opened the doors for stringent action against smokeless tobacco. Later, on World No Tobacco Day, May 31, 2011, a focused VoTV campaign resulted in Chief Ministers of 11 states pledging their support to curb the tobacco menace in their states[7].

In conclusion, the role of civil society is unquestioned and greatly significant in today's times. Apart from the issues discussed in this chapter, non-governmental organizations working on public interest issues in tobacco control can also develop a whole jurisprudence about the advertising ban, health warnings and non-smoker's rights, which greatly contribute to strengthening the legislation and ensuring its comprehensive enforcement. They can additionally support by developing relevant IEC materials and educating the public. They are also important partners in sensitizing and capacitating stakeholders at national, state and district levels in tobacco control. Above all, they can fill in the critical gaps where government mechanisms fall short or are constrained for action.

Summary

Tobacco use is a public health hazard and needs to be regulated and curbed, beyond doubt, using multi-sectoral efforts. Advocacy is the most important means of shaping public opinion, influencing policy

CASE STUDY 1: Tax Advocacy in Tobacco Control

For public health organizations such as VHAI, mounting a tax advocacy campaign meant venturing into an unchartered territory without any previous experience on taxation. It was essential to build capacity and an understanding of the taxation pattern in India with special focus on tobacco taxation. Key strategies included developing a stakeholder analysis of the key elected representatives and bureaucrats, collating local tax statistics to convince policymakers about number of lives that can be saved if tobacco products register a substantial price increase and framing a few clear key 'ASKS' to policy makers. VHAI's engagements with high-level policymakers at central and state level for tax advocacy had successful outcomes. States such as Rajasthan, Himachal Pradesh, Jammu and Kashmir raised taxes on tobacco products between 2010-2012 with a resultant revenue increase. In 2014-15, VHAI's pro-active advocacy with the Health Ministry, resulted in the erstwhile Health Minister, Shri Harsh Vardhan writing to the Union Finance Minister, Arun Jaitley and also all State CMs urging them to raise taxes on all tobacco products. The outcome was the largest ever excise duty increase on cigarettes from 11 to 76%.

CASE STUDY 2: Media Advocacy on Pack Warnings 2015

A collaborative civil society press conference on 31st March at New Delhi. Speakers included Member of Parliament, Ms. Supriya Sule who strongly endorsed the issue. Around 45-50 journalists attended the Conference from the print, electronic, English and Hindi media. From 31st March afternoon till the first week of April, the issue caught major media attention with several TV channels covering it in detail and highlighting the importance of implementing 85% warnings. The topic became the number one debate in the country, so much so, that the media called it "Tobacco gate". There was widespread visibility for the issue across the country.

Following the press conference, an open letter to the Health Minister was also released urging the Government not to backtrack on 85% warnings. Representations and appeals were also sent to the Health Minister from global public health experts, Members of Parliament, celebrities, women and self-help groups, youth associations, hospitals, voluntary organisations, bidi workers' associations, victims of tobacco use, doctors, cancer hospitals, national and state level health organizations. More than 12000 signatures were also received from youth across the country. More recently, 3,300 school students have written to the Health Ministry urging implementation of 85% pictorial health warnings on tobacco products from April 1. Rahul Dravid, who is also the Ambassador for Tobacco Control on behalf of civil society also congratulated the Health Ministry for announcing 85% warnings earlier and made an appeal requesting its speedy implementation, to protect children and youth from tobacco hazards. The result has been that the Health Minister has had to give repeated assurances to the media that the Government is firm on tobacco control measures.

makers and media. Together, with sustained efforts, tobacco use can be gradually reduced, paving the way to a healthier society. Tobacco Control advocacy as an overall concept includes policy advocacy, civil society action as well as media advocacy. This chapter briefly explains how each of these works as a significant advocacy tool. A few important case studies on the subject serve as good examples of how impactful results can be attained.

Unit Review Questions

1. Briefly describe the different types of advocacy used in tobacco control.
2. Why is tobacco control advocacy in India, not easy to achieve?
3. How is the Right to Information an important advocacy tool?
4. What are the methods by which public opinion can be influenced?

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CHAPTER 17

USING STRATEGIC HEALTH COMMUNICATION FOR TOBACCO CONTROL IN INDIA

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Understand strategic health communication terms and approaches.
2. Be able to work through the 4 stage planning cycle and understand the importance of effective messages and communication delivery channels.
3. Know about the international policy frameworks that require support through tobacco control communication.

KEYWORDS

Community media, health communication, inter-personal communication, India, mass media, social marketing, school-based education, tobacco control

1. Introduction

Tobacco-related deaths in India are expected to exceed 1.5 million annually by 2020(1). 35% of Indian adults use tobacco in some form(2) and tobacco-related illnesses cost India's health system USD$ 22.4 billion in one year alone(3). Addressing the tobacco epidemic is hence a critical public health priority.

A solid body of evidence from developed and developing countries – including India – shows that strategic health communication, particularly through mass reach channels and pack warnings, is effective at reducing tobacco use and preventing future uptake(4,5). Additionally, there is emerging evidence of the efficacy of well designed mass communication campaigns to also impact on the most vulnerable groups. Thus, health communication is an important component of proven international strategies for tobacco control. It is a core provision of the World Health Organization's (WHO) Framework Convention on Tobacco Control (FCTC), the first international public health treaty that obligates countries that have ratified the treaty, including India, to "promote and strengthen public awareness of tobacco control issues, using all available communication tools, as appropriate." And it is one of the six interventions recommended by the WHOs M-P-O-W-E-R policy package for best practice tobacco control.

Given the importance of strategic health communication in tobacco control, the purpose of this chapter is to describe the current science and practice of tobacco control communication campaigns.

2. What is Health Communication?

There are numerous definitions of "health communication" but a generally accepted one by the National Cancer Institute (NCI) and the Centers for Disease Control and Prevention (CDC) is as follows: "The study and use of communication strategies to inform and influence individual and community decisions that enhance health."[6] For tobacco control, the purpose of health communication is to inform and influence individuals against tobacco use, and to encourage communities and governments to pass legislation or policies that dissuade the spread of tobacco.

3. Stages of A Health Communication Campaign

For health communication programs to be effective, whether for tobacco control or for other health behaviours, they must be carefully planned, designed, executed and evaluated. Sound communication programs follow a systematic process and draw from successful theories, approaches and existing evidence. Such an approach helps clearly articulate program goals in concrete terms; a theory driven approach allows implementers to consider and plan for how various factors may enhance or impede a program; and finally, they allow a clear evaluation of the program against objectives, and the possibility of replication of the program in new jurisdictions. Successful health communication campaigns follow a thorough and well-established process (see Figure 1). The main stages of the health communication campaign cycle and the objectives of each stage are as follows.

- *Stage 1 – Strategic Planning:* This stage of the campaign during which a great deal of fore-thought, planning, review of existing evidence, consultation with key stakeholders is required to develop a sound plan for the program. It is during this stage that behavioral theories are considered, communication approaches and channels determined. By the end of this stage, campaign goals are clearly articulated, intended audiences are clearly identified, theoretical frameworks and approaches are factored into the planning, and finally, communication activities – including channels of communication, partnerships, and research and evaluation plans – are identified and planned.
- *Stage 2 – Development of Campaign Messages and Materials:* The plan formulated in Stage 1 now unfolds. Formative research may be conducted; messages and creative approaches are developed and tested with intended audiences; campaign materials are produced and dissemination plans (e.g., media plans in the case of mass media campaigns) are finalized.
- *Stage 3 – Campaign Implementation:* During this stage, campaign plans are rolled out. A critical component of this stage is the careful monitoring of the campaign to ensure that it is implemented as planned. Where feasible, and under certain conditions, the program may be tweaked based on immediate feedback from the refined to suit the campaign objectives.
- *Stage 4 – Outcome Evaluation:* During this stage, behavioral outcomes here to emphasize the behavior centered focus of these campaigns. I also use it when talking about objectives as this is the difference between BCC and social marketing interventions and other types of programs.

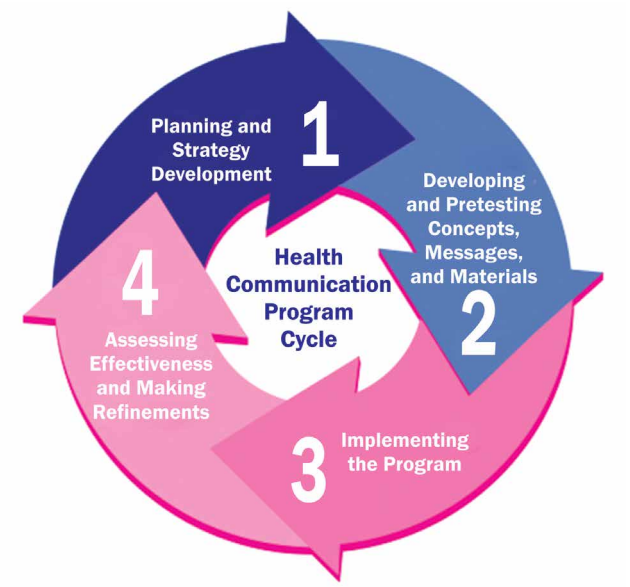

Figure 1. Stages of a Strategic Health Communication Cycle

Source: NCI. Making Health Communication Programs Work. U.S. Department Of Health & Human Services. Westport, Connecticut, Praeger, 1997. xx, 307 p.

4. Behavioural Theories

Health communication managers must consider the various behavioural theories that articulate how behaviour change may be achieved. Behavioural

theories enhance a communication program by identifying determinants of behaviours – individual-level, social and environmental – and pathways to behaviour change. Key theories for tobacco control communication include: Health belief model, theory of planned behavior, transtheoretical (stages of change) model and protection motivation theory. It should be noted that most communication programs typically use a combination of theories to achieve program behavioural objectives since no single theory can apply to all contexts, problems and situations (see Further Reading for additional resources on this topic).

5. Communication Channels

Once the overall approach has been decided, health communication managers must decide the most appropriate channels of communication for the campaign. Health communication can operate at multiple levels and essentially distills down to three generally accepted channels[7]: (i) mass media channels, (ii) community-based channels, and (iii) interpersonal channels of communication. The selection of communication channels for health communication campaigns can often follow-through from the planning and theoretical framework. However, there are key characteristics to each communication channel that determine its relative advantages and disadvantages in a comprehensive communication program (See Figure 2).

Mass media channels operate at the population level and are able to reach the widest and largest audience in the shortest period of time. They include television, radio, newspapers/magazines, outdoor media, direct mail, and more recently, new media (including text messaging) and social media (social network sites, like Facebook). Community-based channels reach a community or a focused group of people, such as those within a prescribed geographical neighbourhood or area. Typically, communities have common defining characteristics, which could include local languages/dialects, socioeconomic features, or ethnicities. Common forms of community-based media include community radio stations, local newspapers, bulletin boards, and posters. They also include community-level activities such as dramas, fairs, concerts, rallies, and parades. Finally, interpersonal communication (IPC) channels include interventions with personal interactions, such as between doctors and patients, teachers and students, relatives and peers, health workers and patients.

IPC channels can be highly effective since they provide for interactivity between message sender and receiver, but rely on the authority and credibility of the communicator. Controlling the messages is difficult and scaling-up takes a long time and is costly. Community media, particularly interactive activities such as dramas, concerts, etc. have the advantage of

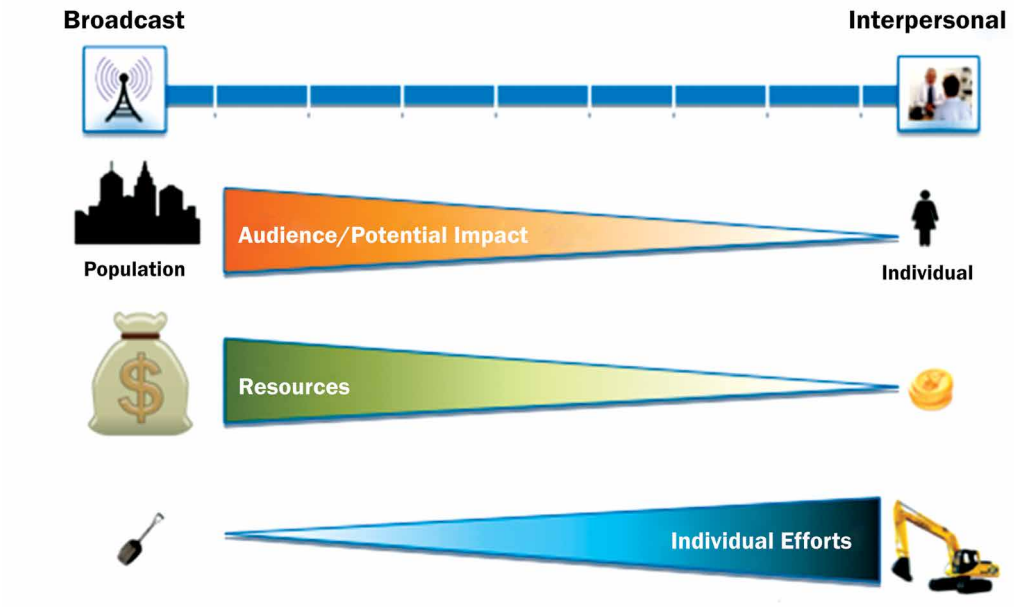

Figure 2. The Communication Spectrum

Adapted from T. R. Frieden, 2010 [8]

Case Study: The Surgeon Campaign, 2010

Government of India and tobacco control advocates noted that while the consumption of smokeless tobacco was high, there was limited knowledge on the harms of smokeless tobacco and it was viewed as a socially acceptable practice, including among women. There was thus a need to create greater awareness of the harms of smokeless tobacco, denormalize (make unacceptable) its use, and urge current users to quit.

In response to this need, World Lung Foundation – a non-profit organization with special expertise in strategic health communication – engaged in the development of a campaign on this issue. Following strategic discussions with experts and stakeholders, an initial concept that described the harmful consequences of smokeless tobacco was developed and message tested in focus groups with smokeless tobacco users. The resulting public service announcement (PSA) titled, Surgeon, was finalized based on feedback from this focus group research. Subsequently, Surgeon was launched by Government of India as a national campaign on mass media channels for 5 weeks. The Campaign was evaluated in a nationally representative population-based survey[9]. The Findings identified was found to have significant reach and impact: 63% of smokeless tobacco users recalled the campaign; campaign awareness was associated with significant improvements in knowledge and attitudes towards smokeless tobacco and an increase in quit attempts.[9]

being participatory and engaging. Other community media, such as outdoor posters, publications, local newspapers and community radio (radio stations that cater to a small community), can be highly credible due to their localized nature. However, these have the disadvantage of low reach and high cost to scale up.

Mass media channels have the advantage of the greatest reach and are highly cost-efficient when the numbers reached are considered. Media like TV and radio are also highly impactful due to the visual and auditory nature of the communication. While 'leadup costs, particularly' could we just say While media placement and production costs can be high, significant savings in production costs can be made by adapting existing best practice media materials (see World Lung Foundation mass media resource at: http://67.199.72.89/mmr/english/index.html). Additionally, effective mass media communication requires technical knowledge from the inception of a campaign to the media buying monitoring and evaluation activities.

5.1 Principles of Effective Health Communication Campaigns

Following decades of implementation of systematic and strategic health communication campaigns and their evaluation, a significant body of evidence has been amassed that has identified certain key principles of effective campaigns. These key principles are as follows[4, 5]:

- Effective messages are those that are understood and resonate with target audiences. Importantly, they create concern and motivate a desire to quit tobacco. In fact, campaign messages that arouse negative emotions like fear and disgust are most likely to be effective.
- Campaigns must run at sufficiently high intensity and must be sustained. Campaigns are most likely to be effective when they use media planning science and reach the largest number of people at sufficiently high levels of frequency (calculated by media planners by a metric called Target Rating Points/ Gross Rating Points). Likewise, to counter the pro-tobacco imagery that is present in society, these campaigns must be sustained through most months of the year.
- Ideally, campaigns are part of a comprehensive strategy that includes the implementation of strong tobacco control policies and laws (e.g., smoking bans).
- Finally, research has indicated that tobacco control messages that focus on the health harms of tobacco work across demographics since the imperative for good health is common to all groups. Indeed, campaigns from high-income countries have been found to be effective in low and middle-income countries as well.

5.2 Pack Warnings: A Policy-Level Intervention for Public Awareness

Strong health messages on tobacco product packages, or pack warnings, are a proven measure to reduce tobacco use[10]. Legible, prominent picture-based health warnings on all tobacco product packages (smoking and smokeless forms) deliver information directly to the users. The message is repeated and reinforced every time a tobacco user

reaches for a tobacco product. Article 11 of the FCTC and the guidelines framed there under requires Parties to the FCTC to implement effective measures to warn against the harmful impact of tobacco use on all tobacco product packaging, within three years after ratifying the FCTC. Packages must carry large, clear, visible and legible health warnings describing the harmful effects of tobacco use, occupying at least but preferably much more than 30% of the pack. In addition, Article 11 suggests pictorial warning labels, which are far more powerful and effective than text only messages. The 'W' of the MPOWER strategy also calls nations/ parties to implement 'effective package warning labels' on all tobacco product packs.

Research shows that effective warning labels increase knowledge about risks associated with smokeless tobacco use and can influence future decisions about smoking (see Figure 3 for effective pack warnings in use in Australia)[11, 12].Large and graphic warning labels can motivate smokers to quit, discourage non-smokers from starting[10], and keep former-smokers from starting again[12]. However, in order to be effective, warning labels must contain graphic images as the evidence is clear that pack warning labels that combine pictures with text are more effective than those that contain text alone. This is a particularly important and relevant finding for a country like India were a substantial proportion of the population is illiterate, particularly those who use SLT.

In addition to the direct impact of pack warnings, marketing mix approaches such as synchronizing with a mass media campaign would amplify the impact of pack warnings. Given that both interventions seek changes in knowledge, attitudes and behaviours, the effects of each combine for stronger impact. Two studies in Australia testing whether exposure to pack warnings was related to the effectiveness of the anti-tobacco advertisements[13], found a complementary and reinforcing relationship between exposure to pack warnings and mass media advertising. This suggests there could be benefits to the introduction of pack warnings synergised with mass media campaigns that provide a deeper, more personalised context for tobacco users.

Summary

The growing tobacco epidemic in India calls for strong and quick action. The science of effective health communication, particularly for tobacco control, has evolved significantly, with proven theories and approaches for informing and influencing tobacco-related behaviour, social norms and public policy. While all communication approaches have their merits and demerits, the evidence to date is strongest for population level tobacco control campaigns utilising mass media channels of communication. A comprehensive tobacco control communication approach would harness the power of mass media to quickly reach large audience numbers, while synergizing with community media and interpersonal channels of communication, to achieve the broadest and deepest behavioural impact. However, it is critical that an evidence-based approach be adhered to, that tests the intended and unintended consequences of interventions, and favours those approaches that can achieve the greatest behavioural impact and cost-efficiencies.

Figure 3. Pre-tested and effective pack warnings in use in Australia.

Unit Review Questions

1. What is the purpose of health communication?
2. What are the stages in health communication planning?
3. What are the different channels of communication and what are there relative merits and demerits?
4. What kinds of messages are likely to be most effective?
5. What are the international policy frameworks that recommend the use of tobacco control health communication programming?
6. Discuss how pack warnings on tobacco products may be a tool of communication.

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CHAPTER 18

ENDGAME STRATEGIES FOR TOBACCO CONTROL

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Understand the processes and pathways followed by countries to move towards an endgame for tobacco.
2. Familiarise with innovative endgame measures, their implementation status and lessons learnt from countries across the world and in India.
3. Understand the challenges, barriers, enablers and the way forward for endgame for tobacco.

KEY TERMS/DEFINITIONS

FCTC, MPOWER, plain packaging, smoke-free, tobacco endgame, tobacco control, tobacco-free, tobacco industry.

1. Introduction

In the new world, Columbus was first offered tobacco on October 15, 1492 and within 150 years the leaves were used around the globe due to the addictive properties of this plant *Nicotiana tabacum*. The plant that was then considered to have healing properties and the cure for all diseases, soon realized to be the cause of several diseases including cancer.[(1)] The first strong tobacco control message in the modern times came from King James I of England in his treatise, a Counterblaste to Tobacco in 1604, where he postulated, *"Smoking is a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black, stinking fume thereof nearest resembling the horrible Stygian smoke of the pit that is bottomless"*.[(2)] In the same century, Emperor Jahangir in India passed orders to prohibit smoking, but these were not effective for long.[(3)]

Tobacco use became a global cause of concern with the Royal College of Physicians in the United Kingdom and the Advisory Committee to the Surgeon General of the United States of America establishing the cause and effect relationship between tobacco use and cancer in early 1960s. The US Surgeon General's Report in 1964 led to the introduction of health warning labels on cigarette packages (Caution: Cigarette smoking may be hazardous to your health) for the first time in USA in 1965 to inform consumers about the health risks associated with tobacco use.[(4)] Ten years later in 1975, India also introduced text only warnings on cigarettes and their advertisements i.e. 'cigarette smoking is injurious to health'.[(5)]

> Ever since I have been grown up, I have never desired to smoke and have always regarded the habit of smoking as barbarous, dirty and harmful. I have never understood why there is such a rage for smoking throughout the world. I cannot bear to travel in a compartment full of people smoking. I become choked."
>
> – **Mahatma Gandhi**

Driven by evidence, countries started making efforts to enact partial anti-tobacco laws. However, a comprehensive tobacco control approach was considered after the World Health Organization (WHO) raised concern over the escalating global burden of deaths and diseases due to tobacco use. The World Health Assembly (2003) adopted the first ever global public health treaty under the aegis of WHO.[6] In force since February 27, 2005 the WHO Framework Convention on Tobacco Control (WHO-FCTC) has been the global beacon and standard for tobacco control. The Treaty, with 180 Parties representing 89% of the world's population, is among the widely ratified treaties in the UN system.[7]

With the goal of effectively implementing WHO-FCTC, WHO recommended a six-point MPOWER strategy to reduce demand for tobacco in 2008.[8] Five years later, Turkey became the first country worldover to achieve all six MPOWER demand-reduction measures for tobacco control at the highest possible level of achievement.[9]

The six evidence-based MPOWER strategies:

- Monitor tobacco use and prevention policies
- Protect people from tobacco smoke
- Offer help to quit tobacco use
- Warn about the dangers of tobacco
- Enforce bans on tobacco advertising, promotion and sponsorship
- Raise taxes on tobacco

In line with several resolutions of the Economic and Social Council of the UN, the Secretary-General established the UN Ad Hoc Interagency Task Force on Tobacco Control in 1999.[10] With the WHO as its Chair, the Taskforce was mandated to coordinate the tobacco control work carried out by various UN agencies. However, the first UN High Level Meeting (UNHLM) on tobacco control was held 12 years later in the UN General Assembly Special Session (UNGASS) on Non-Communicable Diseases (NCDs) in September 2011.[11] The UNGASS recognised the need for tobacco control as a global health imperative. Following calls for tobacco control to be prioritised as part of efforts to address the NCD crisis, the Political Declaration adopted at UNHLM called for effective implementation of the WHO-FCTC.

With this background, this chapter will further discuss the 'next level' of efforts that are being undertaken globally and in India to reduce and contain tobacco use at the population level through composite, evidence-based and innovative strategies. Countries like Finland, Ireland, Scotland and New Zealand have already set ambitious targets and road maps to reduce tobacco use in their countries to a level whereat these countries can be declared as tobacco-free or smoke-free.

2. An endgame vision to advance tobacco control

Tobacco use, an industrially manufactured disease, is the world's leading cause of preventable deaths (WHO, 2008). It was responsible for 100 million deaths in the last century and as many as one billion people are expected to die from its use in the 21st Century (WHO, 2008). The Health Ministries of various countries and several national and international organisations led by WHO have been fighting the battle against tobacco for more than half a century. However, social, economic, health and environmental losses continue unabated[12] with the tobacco industry outdoing efforts to control tobacco use through lobbying, intimidation and promotional tactics and product innovation. Unfortunately, tobacco continues to kill more than six million people every year and at this rate, it will kill eight million people annually by 2030, 83 percent of whom reside in low and middle-income countries.[13]

Periodic surveillance of the tobacco epidemic along with scientific evidence from ongoing research suggests that current national and global efforts may not be sufficient to contain the epidemic. Therefore, several battles at multiple fronts, with greater vigour and resolve are required.[14] To stop the epidemic, global tobacco control communities must step on full throttle for a decisive war on tobacco.[15] This idea has been expressed differently by various authors

and experts. Prof. Malone, Prof. McDaniel and Prof Smith in their report on 'Tobacco Control Endgames: Global initiatives and implications for the UK' term it as 'endgame thinking', meaning thereby, *"[I]nitiatives designed to change/eliminate permanently the structural, political and social dynamics that sustain the tobacco epidemic, in order to achieve within a specific time an endpoint for the tobacco epidemic."*[16] However, the endgame narrative does not replace the existing tobacco control focus, rather addresses the broader issues that go beyond the current measures and is based on new approaches.[17]

Tobacco Control, the globally acclaimed peer-reviewed journal for health professionals and others in tobacco control, published a special supplement issue in May 2013 on The Tobacco Endgame. The supplement compiled some of the leading endgame ideas and strategies from across the globe also taking into view the challenges and barriers in following one or the other path towards tobacco endgame. Some of the ongoing endgame approaches focus on the product (regulating nicotine levels, addictive properties, design, appeal etc.), the user (smoker's licence, doctor's prescription to use tobacco), retail (restricted outlets, display ban, price controls, standardised packaging etc.) and the market system (single manufacturing agency, declining quota on import and manufacture, phase out tobacco products).[18]

In September of the same year (September 10-12, 2013) India hosted 'the International Conference on Public Health Priorities in the 21st Century – The Endgame for Tobacco'. Speaking at the Conference the WHO Director General, Dr. Margaret Chan called for a precise definition of 'tobacco endgame', which must be anchored on impeccable science and backing up of goals and strategies with solid feasibility studies. She suggested that *"a diversity of endgame strategies, as opposed to a single global strategy, might be needed to accommodate these different contexts."* She further emphasised *"Making tobacco endgames a part of overarching development strategies has great policy appeal. A tobacco endgame makes very good sense as a boost to both health and economic development."* After much deliberations, the Conference resolved to define tobacco endgame as,*"a composite of strategies to reduce or contain the prevalence of tobacco use to less than 5%, which is a tipping point of de-normalisation, at which countries are enabled to further completely eliminate all forms of tobacco consumption."*[19]

The fight against the epidemic has been long drawn due to constant interference of the tobacco industry in the process of developing and implementing tobacco control policies. From aggressive marketing and advertising to deceptive ways of circumventing and flouting regulations, the tobacco industry continues to devise means to lure thousands of youth, particularly in LMICs into a death trap every day. In order to achieve tobacco endgame, this pattern must be halted, contained and reversed, which will take time. However, in the past couple of decades, several countries have blown the bugle against this industrially manufactured epidemic. Australia has introduced 'plain packaging' of tobacco products to curb the most personal advertising avenue used by the tobacco industry. Bhutan has altogether banned manufacture and sale of tobacco in the country. India banned manufacture and sale of certain kinds of smokeless tobacco (Gutka) while some Indian states have banned all forms of smokeless tobacco. Countries like South Africa, New Zealand, Turkey and Australia have constantly raised tobacco taxes to arrest the escalating tobacco use in their countries. Nepal, Thailand, Uruguay, Sri Lanka and several others have introduced large-sized pictorial health warnings on tobacco products to prevent youth experimentation and relapse by quitters. Singapore is working on a tobacco-free generation plan, which is also being debated in the state of Tasmania in Australia. Finland and New Zealand have prepared road maps for becoming smoke-free in few decades.

A precondition for implementing a set of endgame strategies is that the country/jurisdiction has ratified the WHO-FCTC (unfortunately, 16 countries including Argentina, Indonesia and the United States of America have not ratified the Treaty) and is at an advanced stage of implementing MPOWER strategies. Uruguay, Turkey, Canada, Australia and Thailand[20] have already seen sharp decline in prevalence of tobacco use. Daily smoking rates in the province of California, USA (9.8%), New South Wales, Australia (13.9%) and British Columbia, Canada (11%) have witnessed plunging trends.[21] With the current trends of decline in tobacco use, it is being predicted that Sweden and Australia may be "Zero" prevalence countries by 2028 and 2030 respectively.[22] Another factor enabling an endgame scenario is a high level of public understanding of the tobacco burden. Comprehensive and sustained tobacco control efforts in a country require support from all stakeholders led by political commitment, like in Uruguay and Sri Lanka (in both

countries, the Presidents supported strong and comprehensive tobacco control efforts) while in New York, Mayor Bloomberg's vision contributed to a steep decline in tobacco use from 22% in 2002 to 16% in 2008.[23]

3. Global preparedness and progress on endgame strategies

Experts aiming at the endgame, set a target for tobacco-free world as less than 5% of people consuming tobacco in a country by 2040.[24] Tobacco control is also becoming integral to the sustainable development agenda. Leveraging on the momentum generated by the UNGASS on NCD prevention and control, World Health Assembly (2013) prioritized 30% relative reduction in tobacco use prevalence by 2025 (compared to the a baseline of 2010) and called for a swift move towards eliminating tobacco use in all forms globally by 2050. Several countries have planned and started their countdown to reduce tobacco use to negligible levels (<5%) by adopting multiple strategies towards this end.

3.1 Complete ban on manufacture and marketing of tobacco products

Bhutan: Cultivation, manufacture, sale, and distribution of tobacco products in Bhutan is prohibited since 2004 under national policy and codified as law under the Tobacco Control Act of Bhutan in 2010. However, the law permits a limited quantity of tobacco products to be imported for personal use. The law prohibits smoking in public places and also prohibits tobacco advertising, promotion and sponsorships. Even manufacture and sale of products or candies resembling tobacco products is prohibited in the country.

Australia and New Zealand: In 1986, the South Australian Government became the first government in the world to ban smokeless tobacco. The ban became national in 1991 (Chapman & Wakefield, 2001). New Zealand has also banned smokeless tobacco (WHO, 1997).

European Union under Directive 2001/37/EC: EU Member States prohibit the marketing of tobacco for oral use, exempting Sweden and the European Free Trade Association countries i.e. Iceland, Liechtenstein, Norway and Switzerland.

Other countries and regions have had varied regulatory experiences, ranging from banning all or some smokeless tobacco products (Singapore, Brazil, Bahrain, United Arab Emirates, Turkey).

3.2 Prohibition on sale to minors

Majority of tobacco users start before 18 years, and almost all by the age of 26 years. Hence, restricting youth access to tobacco is critical to end the tobacco epidemic.[25] In line with WHO-FCTC Article 16, several countries impose an age limit on the purchase of tobacco products by minors. Some jurisdictions impose access restriction up to the age of 21 years to prevent early initiation and reduce tobacco use burden.

Going a step forward, tobacco control proponents in Singapore have started a project to campaign for a tobacco-free millennium generation. The project proposes a long-term phasing-out of tobacco by restricting supply of tobacco to individuals born in or after the year 2000.[26] This essentially means that anyone born in or after the year 2000 will never legally be able to buy tobacco, at any age. Similarly, in Australia's island state of Tasmania, an Independent Member of Parliament, Mr. Ivan Dean has tabled a Private Member's Bill which would, from 2018, make it illegal to supply tobacco to anyone born after 2000. With nearly one third of 18-24 year-old Tasmanians smoking, the Bill has received wide support from tobacco control, cancer control and NCD control organisations in the state.[27] This generational method of phasing out of tobacco is worthy of consideration as an assured path to the ultimate eradication of tobacco supply in jurisdictions where the social climate is conducive.[28]

To prevent youth from tobacco, one of the primary aims of the new tobacco control plan of England is to reduce smoking prevalence among 15 year olds to 12% or less by the end of 2015.[29] Similar plans have been developed for other countries in the United Kingdom (Wales, Scotland and Northern Ireland). The minimum age to buy tobacco in the UK is 18 years with prohibition on proxy purchase as well (i.e. it is an offence for an adult to buy cigarettes for anyone under the age of 18 years). Vendors are required to register themselves in order to sell tobacco, while negative licensing is followed against retailers persistently flouting the age of sale law.[30]

3.3 Tobacco free/Smokefree jurisdictions

New Zealand adopted the aspirational goal of 'reducing smoking prevalence and tobacco availability to minimal levels. The Government agreed to the recommendation of the Māori Affairs Committee to aim for tobacco consumption and smoking prevalence to be halved by 2015 and to achieve the smoke-free goal by 2025.[33]

Ireland adopted a tobacco-free policy in 2013 with an aim to reduce tobacco use to a level where less than 5% of the population smokes (down from the 22% of those aged 15 and over who are currently regular smokers) by 2025.[34] The policy primarily focuses on de-normalizing smoking in Irish society and inter alia aims to:

- Protect children from the harms of tobacco
- Enforce, regulate and legislate for tobacco activities and products
- Educate citizens about the dangers of tobacco
- Assist those who smoke to stop

Scotland has set a target date of 2034 for reducing smoking prevalence among adults to 5% or lower. The tobacco-free Scotland policy underlines that the key factor in ensuring success will be maintaining the continued downward trend in the take-up of smoking among young people.[35]

Finland envisions ending the consumption of tobacco products by 2040, with no more than 2% of Finns aged 15 to 64 using tobacco products.[36] The roadmap to tobacco-free Finland drafted to achieve the goals set out in the Tobacco Act (693/1976) mainly aims to create an environment where children and young people do not use tobacco products, while supporting existing tobacco users to quit.[37]

3.4 Plain Packaging of Tobacco Products

Tobacco packs are valued by the industry as a means to promote their products.[38] With increasing restrictions on tobacco advertising, promotion and sponsorships (TAPS), the packs become the mobile

BOX 1: NO MORE TOBACCO IN THE 21ST CENTURY
A youth-led movement towards a tobacco-free world

The 'No More Tobacco in the 21st Century' or NMT21C movement was launched during the 'Endgame for Tobacco Conference' in India in 2013 to mobilize youth world over to advocate for systemic and policy changes that promote tobacco-free social norms. The movement envisions bringing together all youth-led initiatives that work towards preventing and eventually eliminating tobacco use by future generations. The Conference declaration adopted NMT21C as a symbol for the global movement for elimination of tobacco (Figure-1).[31]

Figure 1 Global Symbol of NMT21C

A pre-conference youth workshop on the theme of NMT21C was held during the 16th World Conference on Tobacco OR Health, held in Abu Dhabi, UAE, in March 2015. The workshop aimed to build leadership and advocacy skills of youth delegates, who convened from nearly 40 countries and provided a networking platform to collaborate on tobacco control campaigns. During the Conference, several world leaders and dignitaries interacted, encouraged and supported the youth's call for 'No More Tobacco in the 21st Century'. The Youth Resolution adopted at the Conference called upon all the stakeholders to take decisive action to protect youth from the tobacco industry tactics.[32]

billboards for the tobacco industry. Therefore, plain packaging is the most significant step to prevent the last unregulated facet of TAPS by the tobacco industry. Plain packaging has also been proposed under the guidelines to implement Article 11 of WHO-FCTC.[39]

Based on the recommendations of the National Preventative Health Task force in 2010, the Australian Prime Minister announced that the Government would adopt tobacco plain packaging. *The Tobacco Plain Packaging Act 2011* (TPPA) received Royal Assent and became law in Australia on 1st December, 2011. Consequently, plain packaging of tobacco products came in force from 1st December 2012 (Figure-2). The law also banned trademarks or other marks from appearing on tobacco products, thus preventing brand or variant names and other embellishments from appearing on cigarette sticks.[40]

Tobacco industry vehemently opposed enforcement of TPPA and litigated against it. The Australian High Court found no merit in the Industry's arguments and upheld the constitutionality of the law.[41] Research studies evaluating impact of TPPA on tobacco use in Australia reveal that "more smokers disliked their pack, perceived lower pack appeal, lower cigarette quality, lower satisfaction, lower value and disagreed brands differed in prestige."[42]

With TPPA in place, researchers observe significant increase in quitting and higher rates of quit attempts.[43] As per figures from the Australian Bureau of Statistics, the seasonally-adjusted figures show a 12.2% yearly fall in consumption of cigarettes from December 2013 to December 2014.[44] Following Australia, Ireland and UK have announced plain packaging law to be in effect soon while France, New Zealand, European Union and many others are all set to follow suit.

4. Endgame scenario for India–Leapfrogging policies

India was at the forefront of the global tobacco control movement and led the WHO-FCTC negotiations for insertion of stronger provisions in the Treaty. It was not merely a coincidence that the Cigarettes and Other Tobacco Products (Prohibition on Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003 and WHO-FCTC were adopted concurrently in May 2003. A decade later, India hosted the first ever, 'Endgame for Tobacco Conference' to take stock of the decadal progress and to assess global and national preparedness to walk an innovative and radical path for putting an end to tobacco. Some of the stronger steps taken by India towards this goal include:

4.1 Prohibition on sale of Gutka and other smokeless tobacco products

India prohibited use of tobacco and nicotine as ingredient in any food item under the Food Safety and Standards Regulations, 2011. This effectively paved

Figure 2: Australian Plain Packs

Figure 3: Dr. Margaret Chan Speaking at the Endgame Conference held in New Delhi (September 2013)

> ***"Endgame strategies threaten the very existence of the tobacco industry."***
> **Dr. Margaret Chan (Figure 3)**

the way for restricting manufacture and sale of Gutka across the country. In compliance with the Food Safety and Standards Regulations, 2011 some states have banned sale of all forms of smokeless tobacco. Assam became the first state to prohibit sale of smokeless tobacco in February 2014 under the Assam Health (Prohibition of manufacturing, advertisement, trade, storage, distribution, sale and consumption of zarda, gutka, pan masala, etc, containing tobacco and/ or nicotine) Act, 2013.[45] The state of Bihar ordered across-the-board ban on smokeless tobacco products in November 2014. The Patna High Court, hearing a petition from a Zarda manufacturer and others stayed the order in December 2014.[46] However, upon appeal, the Supreme Court of India reversed the stay.[47] Other states with ban on more than one form of smokeless tobacco, other than Gutka, include Andhra Pradesh, Goa, Telangana, Jammu & Kashmir, Manipur, Mizoram, Maharashtra, Kerala and Himachal Pradesh.

4.2 Plain packaging of tobacco products in India

Following Australia's visions of plain packaging of tobacco products, a collaborative taskforce comprising of key tobacco control advocates and researchers from Australia and India was established in 2011 to explore the feasibility of introducing plain packaging in India. Research and policy mapping exercises were carried out under the aegis of the Task force to expand the body of evidence relating to plain packaging in India. In a study assessing perceptions and support among Indian people on plain packaging of tobacco products, plain packs were favoured by majority of participants (69%) and key stakeholders (92%). Study participants felt it would reduce the appeal and promotional value of the tobacco packs (>80%), prevent initiation of tobacco use among children and youth (>60%), motivate tobacco users to quit (>80%), increase notice ability, and effectiveness of pictorial health warnings on tobacco packs (>90%). Most of the participants favoured light grey colour (Figure-4) for plain packaging of tobacco products in India.[48]

A comprehensive review of the existing laws and policies was undertaken, in addition to a stakeholder consultation to develop a detailed report on feasibility of plain packaging in India.[49]

Based on the research results, grey dummy packs were prepared and shared with policy makers and media to raise awareness and the public support for plain packaging in India.[50] Support to the initiative was evident when Lok Sabha MP Baijayant Jay Panda introduced a Private Members' Bill, during the Winter Session of the Parliament in 2012, seeking plain packaging of tobacco products in the country.[51] He re-introduced the Bill again in 2014.[52]

More support came from the Allahabad High Court, in July 2014, on a petition from the Love Care Foundation, for plain packaging of tobacco products. The Court recommended to the Centre to consider plain packaging rather than fancy packets and observed, "colourful packaging in vogue currently

draws the attention of youths such packaging becomes an incentive for the immature youth to start smoking."[53]

4.3 Tobacco free and smokefree villages, panchayats, districts and states

Tobacco control in India does not constitute only a national programme which runs in a top-down manner by the Central and State Governments. It has been widely embraced at the grassroots level with small villages and panchayats undertaking initiatives to eliminate tobacco use within their jurisdictions. Shankarpura in Haryana, Chinch Gohan in Madhya Pradesh, Pongalipaka in Andhra Pradesh, Gariphema in Nagaland and several other villages in the country have been declared tobacco-free. The credit for these villages becoming tobacco-free is context specific and in most cases due to exemplary leadership and commitment of the Village Heads. Several districts including Mohali, Kottayam, Villupuram, Jhunjhunu, Bhadrak and Bhubaneshwar, in the last few years have become smoke-free while states like Himachal Pradesh, Sikkim, Mizoram and Union Territory of Chandigarh are already declared and compliant to smoke-free standards in India.

4.4 Tobacco-free movie rules

A 2011 study found that the odds of ever-use of tobacco (using tobacco once or more) among students who were highly exposed to tobacco use occurrences in Bollywood films is more than twice as compared to those with low exposure.[61]

To limit promotion of tobacco products and tobacco use in movies and television programmes the Ministry of Health and Family Welfare (MoHFW) notified rules requiring display of health spots and health messages in movies and television programmes depicting tobacco use.[62] Keeping with these Film Rules under Section 5 of COTPA (prohibition on TAPS), the Central Board of Film Certification (CBFC) was directed by the Kerala High Court to prohibit depiction of tobacco use in films.[63] With prohibition on display of tobacco brands and product placement, India is one of the few countries with such stringent rules on display of tobacco products or use in film and television programmes. Responding to a filmmaker's petition challenging the rules, the **Supreme Court of India observed:**

"Why don't you make films without cigarettes and liquor? You make a film without them and you will get a certificate easily. You are not supplying the viewers with something essential by showing cigarettes and liquor. We could understand if you are showing food or water in your films. We don't have any problem with that but these (cigarettes and liquor) are not a must."[64]

An evaluation of anti-tobacco advertisements in cinema reveals that besides significant improvement in knowledge and attitudes towards tobacco control measures, it motivated participants not to use tobacco (Kaur J, 2012).[65]

Figure 4: Dummy Plain Packs in Light Grey Colour

BOX 2: The tobacco free village - Pongalipaka

The Public Health Foundation of India implemented Project STEPS (Strengthening Tobacco control Efforts by innovative Partnerships and Strategies) in 12 districts of Andhra Pradesh and Gujarat. As part of intervention, several community-level activities were undertaken to disseminate awareness about the hazards of tobacco use among villagers through wall writings, community walk and self-help groups. Pongalipaka was one of the villages under the project in Andhra Pradesh. A unique feature of the village is that, despite being in the largest tobacco growing state of the country, none of the villagers are involved in tobacco cultivation and farming. The village sarpanch was sensitized through a Community Against Tobacco (CAT) group constituted for the Madugula Mandal. The CAT group emphasized on the tobacco burden and the need to restrict sale of tobacco products to minor. Motivated to fight against tobacco and armed with information, the sarpanch decided to take steps for protecting the villagers, especially children, from the hazards of tobacco use. As a result of STEPS intervention and support from the villagers, Pongalipaka village was declared tobacco-free on May 31, the World No Tobacco Day, 2012. Many other villages in Andhra Pradesh and Gujarat became tobacco-free with intervention support from Project STEPS.[54,55,56,57,58,59,60]

4.5 Other measures

Pictorial health warnings (PHWs) are the most effective ways of communicating ill effects of tobacco use, particularly among those with low literacy or no formal education. The Ministry of Health and Family Welfare has notified larger and stronger set of warnings in October 2014 to be enforced from April 1, 2015. However, the larger warnings are kept in abeyance due to an interim report of the Parliamentary Committee on Subordinate Legislation (Lok Sabha).[66,67] With the larger warnings coming into force, India will be among world leaders in pictorial health warnings on tobacco packs.

In addition to the larger pictorial health warnings, MoHFW has also proposed to amend COTPA.[68] The proposed draft amendments include significantly stronger and effective measures intended to plug the existing loopholes in the law and to limit tobacco industry interference in tobacco control policy making in the country.[69,70]

4.6 Challenges in moving forward with Endgame Strategies

Globally, the tobacco industry is the biggest barrier in implementing stronger and effective tobacco control measures. The industry continues to undermine and circumvent effective laws and regulations. It employs all possible means to discredit evidence and intimidate governments against taking stronger measures of tobacco control. It raises the burden of economic losses, through lost revenue and employment, while challenging every regulatory measure through repeated litigation. Without regulation, the tobacco industry will continue to act as the highest impediment to endgame strategies worldwide. Besides the tobacco industry, a major challenge for India in moving forward with endgame strategies is the use of myriad forms of tobacco products across the country. High prevalence of bidi smoking and tobacco chewing poses difficult questions of choices, rights, employments and livelihoods. The cottage and unorganised nature of manufacturing several tobacco products makes their regulation difficult and weakens any effort to curb their use among population. For example, bidi production is fragmented and most brands are hand-rolled in individual homes on a small scale. The bidi industry is therefore, considered to be a cottage industry and is the least taxed tobacco product in India.[71] Even tax policies become ineffective due to the availability of substitutes.

Another challenge is to provide economically viable alternatives to tobacco growers, bidi rollers and tendu leaf pluckers. It is encouraging to note that MoHFW has started taking initiatives to bring alternative cropping systems and provide alternative livelihood options to bidi rollers, tendu pluckers and tobacco farmers. The MoHFW has collaborated with the Central Tobacco Research Institute (CTRI) for a pilot project on alternative cropping systems to tobacco cultivation. The MoHFW is also in discussion with Ministry of Rural Development to work out special projects for the bidi rollers under the National Rural Livelihood Mission (NRLM). Government schemes like minimum job guarantee (100 days), under the Mahatma Gandhi National Rural Employment Guarantee Act, 2005, can be considered for alternative employment for bidi rollers and tendu pluckers.

One of the necessary steps for implementing an endgame strategy is to ensure that there are adequate avenues for tobacco users to seek cessation facilities. Effective tobacco cessation services should be accessible, affordable and available for the tobacco users as an easy recourse to complement and to ensure sustainable long term impact of any strong tobacco control measure.

5. Way Forward

There is a global consensus between the tobacco control community and Governments on eliminating the menace of tobacco. However, the 'endgame for tobacco' will require a strategic plan to reduce prevalence to a minimal level (< 5%) within a set period (say 15-20 years). The key to achieve this target is to effectively de-normalise tobacco use at the population level and freeze access and exposure of minors to tobacco.

It is also important to focus on supply-side measures like product regulation with reduced nicotine content and regulated emission levels besides progressive tobacco taxation and price controls on all tobacco products. Removing profitability from the business of tobacco will be the key to limiting tobacco industry interference in tobacco control policy making and also keeping the industry in check. To this effect, it is crucial that the tobacco industry is held liable for violation of tobacco control laws and regulations besides being required to pay for the health, economic, environmental and social burden due to tobacco use.

While WHO-FCTC and MPOWER strategies provide the fundamental tobacco control roadmap, any effective step towards endgame should consider further elevating existing norms. For example, smoke-free standards must strive for smoke-free private transport, smoke-free residential complexes and smoke-free homes to protect non-smokers and particularly children's exposure to tobacco smoke at all places.

Any endgame strategy to work in the long run will require effective and affordable tobacco cessation services including nicotine replacement therapies (pharmacotherapy), counselling, and community-based cessation facilities, not only for smoking products but also for dealing with the addiction of smokeless tobacco.

Considering the threat of tobacco on health, economic development, environment and social well-being an effective endgame strategy will significantly contribute in achieving the developmental goals. Though the historic oversight of omitting tobacco control from the Millennium Development Goals has been partly addressed with the Adoption of WHO-FCTC in 2003 and the political declaration at the UNHLM in 2011, it is essential that tobacco endgame is integral to the post 2015 sustainable development goals and governments across the world accord a high priority to eliminating tobacco in the 21st century.

Summary

A comprehensive global response against tobacco began with the adoption of the Framework Convention on Tobacco Control in 2003. The global community also recognised that effective tobacco control was a global public health imperative and must be prioritised to address the inundating global NCD crisis. However, to contain an industry sponsored epidemic, the current efforts and initiatives may not be sufficient and require a decisive war for the 'endgame for tobacco'. The Endgame strategies must be designed to reduce, contain and de-normalise tobacco use to be able to permanently eliminate the tobacco epidemic. Several countries are on a path to achieve a time-bound endpoint for the epidemic. These include New Zealand and Ireland by 2025, Sweden by 2028, Australia by 2030, Scotland by 2034 and Finland by 2040. Bhutan already leads the world with complete prohibition on manufacture and sale of tobacco products while Singapore, Tasmania and United Kingdom are considering action plans for tobacco-free future generations. India has taken several strong steps (gutka and smokeless tobacco ban, tobacco-free movies, tobacco-free villages) before hosting the first ever 'Endgame Conference' in 2013 which adopted 'NMT21C' as a symbol for the global movement for elimination of tobacco. As Dr. Margret Chan says, *"Endgame strategies threaten the very existence of the tobacco industry" and "makes very good sense as a boost to both health and economic development."*

Unit Review Questions

1. What do you understand by tobacco endgame? What are different approaches or strategies being considered to achieve endgame for tobacco?
2. How would the plain packaging of tobacco products accelerate tobacco control?
3. What are the challenges in adopting and implementing endgame strategies in India?

Application question (s)/ Assignment

1. From the Australian experience of plain packaging, make a case for countries to consider plain packaging while implementing Article 11 of FCTC.
2. Examine the tobacco-free millennium generation concept from a LMIC perspective. Discuss the strengths and weaknesses of implementing this concept in India?

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CHAPTER 19

OPERATIONAL RESEARCH IN TOBACCO CONTROL

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LEARNING OBJECTIVES

By the end of the chapter, you will be able to

1. Understand Operational Research (OR), its characteristics, principles and approaches in relation to Tobacco Control.
2. Differentiate the OR from other types of researches.
3. Document the priorities of OR in Tobacco Control.

KEYWORDS

Operational research (OR), PGIMER-The Union model, tobacco control

1. Introduction to OR

Operational Research (OR) is known by myriad names- Operation research, health service research, health systems research, action research, implementation research, decision oriented research. Barring minor differences, all of them are quite similar. Being multi-disciplinary in nature, Operational Research has been defined differently by researchers of various disciplines. It was famously defined by mathematicians as a branch that used advanced analytical methods (formulas or complex models) to arrive at a decision.[1] Other define it as scientific study to establish evidence based practices and promote them in routine practices (or health programmes) to improve the quality of health care.[2] Lately, it was defined in a global meeting at Geneva in April 2008 as 'Any research producing practically usable knowledge (evidence, findings, information etc.) which can improve programme implementation (e.g. effectiveness, efficiency, quality, access, scale up, sustainability) regardless of type of research (design, methods, approach).[3] Another definition proposed by International Union Against Tuberculosis and Lung Diseases (The Union)-Medicines Sans Frontieres (MSF) is search for knowledge on strategies, interventions, tools that can enhance the quality, coverage, effectiveness or performance of health system or programmes in which research is being conducted.[4] Whatever the definition is, the key words in OR are 'science of improvement', 'generating evidence based and practical solutions to a problem', 'science of converting research into policy and policy into practice'.

2. History of OR

Historically, the term OR is rooted in military and industrial sector. For example : In the second world war, Patrick Blackett, an OR scientist in British army helped in reducing the the average number of artillery rounds needed to knock down a plane from 20,000 to 4000. In the commercial sector, OR was used as early as in 1840 by Charles babbage where his research into the cost of transportation and sorting of mail led

Case study : 1
Implementation of national guidelines for screening patients for tuberculosis with > or =2 weeks cough, compared to > or =3 weeks

Few years back, RNTCP recommended examining three sputum smears for AFB from Chest Symptomatics (CS) with cough of 3 weeks or more for diagnosis of Pulmonary TB (PTB). The research question was whether there was an incremental yield by screening patients for tuberculosis with > or =3 weeks as compared to > or =2 weeks cough. Method: Different level of health care facilities with high out-patient attendance were selected from Tuberculosis Units (TU) in each district of a state to screen about 10000 new adult out-patients. Results: Using > or =2 weeks of cough instead of 3 weeks as the criterion for screening, there was an overall increase of 58% in Culture Sensitivity and 23% increase in the detection of smear-positive cases.

Feedback: It is an OR as it is a research in existing intervention/tool of programme (> or = 3 weeks cough) versus the proposed intervention (> or = 2 weeks cough), which led to increase in effectiveness or improvement (increased yield of TB cases) of programme. It generates evidence based practical solution to problem and has led to change in policy and practice.

Many of such operational research study findings have been used to modify policy and practice, e.g. using two sputum samples instead of three in tuberculosis for diagnosis of tuberculosis and dropping Cat III from the regimens etc.

to England's universal "Penny Post". Other examples include looking at the dynamics of train coaches with the narrow gauge rail lines, which led to development of broad gauge; improving the working of the UK's early warning radar system; improving the scheduling of airline crews; better designing of waiting lines at Disney theme parks etc.

3. Characteristics of OR

The following are the characteristics of OR which differentiates it from other researches:

1. Can deal with wide range of public health issues-problems with poor quality, sub-optimal coverage, problems in scaling up of intervention, poor cost efficiency of existing intervention, lesser effectiveness, feasibility etc.
2. It is not methodologically defined (can use any type of quantitative or qualitative method to arrive at the solution)
3. In OR study, changes in inputs (necessary resources) and processes (programme activities) are done to measure changes in output (immediate results at programme level and/or increased knowledge of target group), outcome (change in behaviour and practices) and impact (long term effect of project or programme in terms of morbidity or mortality). It means independent variables (inputs and processes) are manipulated by program managers to get dependent variables (program outcomes).
4. Goal of OR is dissemination of positive outcomes of study to appropriate stakeholders and sustain them in routine practice and ultimately bettering the health system.
5. Gives context specific local solutions (cultural, geographical etc.) rather than generic answers to a problem. It helps in greater acceptability and uptake of services. At same point of time, OR can help in developing strategies on a global scale (generalizability)
6. It is not normally done in controlled settings, but in routine programme (uncontrolled) settings. This makes an OR study easier to do with less ethical requirements.
7. It may or may-not require complex methods or analysis to arrive at the solution.
8. The substance of OR is that it focuses on factors under the control of managers. If managers can't do anything about the problem, OR does not study it. The factors under control can be program systems, training, knowledge of clients etc. whereas, those not under control can be cultural beliefs location, religion etc.

4. Principles of OR

There are 3 key principles of OR:

1. The programme or project should have **well defined goals and objectives;**

2. The **constraints** or barriers to meet those objectives are identified and prioritized;
3. **Research question** framed to address these constraints.

   For 3rd principle, research question can be of three types

   a. Is there a lack of knowledge? Case Study-2 is an example of OR into lack of knowledge about why initiation of tobacco use among youth is increasing.
   b. Is there a lack of a tool or intervention?
   c. Is existing tool(s) used inefficiently? Case study-1 is an example of OR into inefficient existing tool (i.e. a criteria of cough for 3 weeks or more for diagnosis of Pulmonary TB)

5. Approaches to OR

It is primarily divided into two major types:

1. Primary level research (collecting primary data): It is further of three types: Descriptive (just describing the characteristics or cross-sectional: descriptive with some analytical

Box 1: What is not OR?

Basic science, genetic research, experimental (or clinical) research and randomized control trials are often not considered as OR. Even monitoring and evaluation, formative evaluation, and quality assurance are not OR. All of these researches need a controlled setting (or environment) with inclusion and exclusion criteria's, while OR assesses outcomes in uncontrolled programme settings. Therefore, these provide data on efficacy (best outcome in controlled settings) of intervention in identified groups, while OR determine effectiveness (optimal outcome in uncontrolled and real world settings). However, it should be remembered that both RCT and OR are important and should be done in a continuum. An RCT generates highest level of evidence initially under controlled conditions, whereas, OR shows how to apply that knowledge under real world conditions

Case Study: 2
Designing an OR study in National Tobacco Control Programme

Programme: National Tobacco Control Programme

Goal: To facilitate effective implementation of the COTPA

Objectives: To protect the youth and masses from the adverse effects of tobacco use

Constraint: Initiation of tobacco use among youth is increasing

Research Question: Why initiation of tobacco use among youth is increasing?

Methodology to be adopted:

Approach-1

1. Ask representative group of youth (Descriptive study) or ask both the tobacco users who initiate below 18 years and matched controls who initiate over 18 years (case control) or generate themes/ codes of why they initiate early (qualitative study)

Approach-2

1. Get a dataset which is representative; e.g. Global Adult Tobacco Survey conducted in India
2. Get the data on those initiating tobacco use (may segregate by type of tobacco) below a cut point (say 18 years) and also those above that cut point.
3. Find (and compare) the socio-demographic and other factors in both the groups followed by regression analysis to find the significant factors.

Solution: The programme seeks to solve the problem of early initiation thus reducing the prevalence of tobacco use and ultimately decreased morbidity and mortality due to tobacco use

component), Analytical (case-control or cohort) and Experimental/Interventional. Interventional researches, which require a controlled setting are not considered under OR. In addition, exploratory studies (or formative research) to find the extent of problems and economic analysis to assess the cost and/ or cost-effectiveness of intervention are other two primary level researches. The prior primarily employ qualitative methods. (Case study 1 is an example of primary level research)

2. Secondary level research (utilizing the existing secondary data or records/reports of routine programmes): Now a days it is considered better in terms of availability of ready data, cost-effectiveness, minimal time required for analysis, and lesser ethical strictness for their approval.

Box 2: Study Designs in OR studies

1. Descriptive Or Cross-sectional

- Most often type of OR studies.
- Exposure and outcome measurements at **one time** with respect to the study participant's time, and NOT with respect to the investigator's time. Thus, the temporal association between exposure and outcome cannot be established (i.e. 'what leads to what' cannot be established). It just informs about the possible risk factors.

2. Case control

- **Begin from outcome** (cases) and moves towards exposure
- In retrospective cohort study also, we take data of the past (so calender time is not important to distinguish between two!). The important is whether the study begins with diseased and non-diseased people (case-control study) or with exposed and non-exposed people (cohort study).
- We calculate **Odds Ratio** (or cross-product ratio) which is estimated risk of outcome with given exposure as compared to non-exposed.
- In **nested case-control study** (variant of case control study), we take the cases and controls from the defined cohort and compare them for exposures. Here we take initial data from all respondents eliminating recall bias, which is peculiar of case-control study. Further, cases and controls are derived from the same original cohort, so there is likely to be greater comparability between the cases and the controls than one might ordinarily find in a traditional case-control study. Only after the disease has developed in some subjects is a nested case-control study begun and the specimens from the relatively small number of people who are included in the case-control study are thawed and tested, thus reducing the laboratory cost. As we have taken the sample at the initial stage, the abnormalities detected are more likely the risk factors or other premorbid characteristics. When such abnormalities are found in the traditional case-control study, we do not know whether they preceded the disease or were a result of the disease.

3. **Cohort (Retrospective or Prospective)**

- Exposure and outcome measurements at **different times** (in prospective: exposure precedes outcome; in retrospective: outcome precedes exposure) *with respect to the study participant's time,* and NOT with respect to the investigator's time.
- **Multiple outcomes** from a single exposure can be measured
- Calculate **incidence** of outcome
- Calculate **Relative Risk** (risk of developing the disease among exposed as compared to un-exposed), and **Attributable risk** (risk of outcome attributable to the exposure).
- Done mainly when exposure is rare
- Not suited if long term follow up is required due to non-response or information bias.
- **Most record reviews are classified under retrospective cohort study.**

4. Experimental design

- It is not normally an OR study design (please see section 'what is not OR')
- It can be experimental with no comparison group (phase-1 and 2 trials) or experimental with comparison group (randomized and non-randomized controlled trials)

Box 2: Study Designs in OR studies

- The exposure is **assigned by investigator** (unlike observational studies above)

5. Ecological

- Units of observations are **populations** (unlike observational and experimental studies above, where unit of observation is individual) rather than individuals, therefore interpretations (possible hypotheses) should also be at population level.
- Correlational studies using aggregate measures of the populations.
- Very easy to be done with available dataset
- Example: Lung cancer rates and smoking rates

6. **Exploratory or Formative**

- To define or explore the 'extent' of problem
- Generally done **before design of a programme** (if we do not have the available data on the problem: How do we get the research question then?)
- It may employ both quantitative methods (cross-sectional, case control, cohort design) or qualitative methods (In-depth interviews, Focus group discussion)

Case Study: 3
Does behaviour of buying loose cigarettes increase the intensity of smoking?: example of secondary level research

Increase in tax on tobacco products has led to decrease in overall cigarette consumption in India, which has also led to an increase in sale and purchase of loose cigarettes. The research question was whether there is an association between behaviour of buying loose cigarettes and intensity of smoking. A secondary analysis of Global Adult Tobacco Survey, India 2009-10 data was done on adults 15 years and above. It was observed that the intensity of smoking was 70% less among loose cigarette buyers than non buyers (OR 0.29, CI 0.24-0.34). It was concluded that there may be an increase in selling and buying of loose cigarettes due to policies of increasing taxes but it has also led to decrease in intensity of smoking. This finding promotes single cigarette availability and also encourages policy makers to increase taxation on packaged cigarettes.

However, it often lacks quality standards (during data collection and data entry) and con-founders peep in the study. Both the things, however, can be taken care of.

6. Benefits of OR

OR is beneficial for three primary reasons :

- Improving programme outcomes
- Assessing feasibility of new strategies or tools or interventions in specific settings or populations
- Advocating for policy change

7. Enabling factors in conducting OR

1. The first and foremost enabling factor is to ensure that OR is of direct relevance to the national program. This is because programme staff/ managers are already busy and over burdened and will buy your research only if the study question is of importance to programme implementation and health service delivery. It should also be in line with current research priorities at national/state level.

Box 3: Enabling Factors for conducting Operational Research in a teaching and research institution

1. A critical mass of academicians and researchers who have knowledge about the programme and also research skills
2. Rapport and collaboration with programme managers who can provide them with constraints or operational bottlenecks in the programmes.
3. Scientific presentation of results to various stakeholders including advocacy to policy makers and peer reviewed publications.
4. Credibility amongst policy makers and media, which assist in uptake of recommendations into policy and practice.
5. Institutional Ethics Committee/Board exist for facilitating the study protocol.
6. Sustainability of intervention including monitoring and supervision, if conducted in field practice area

2. Secondly, a well defined coordinating mechanism and partnership between researcher and program manager is essential. It will ensure the joint ownership of research, which is likely to be translated into policy and practice. Non involvement of implementers (or program managers) may lead to choosing of an in-appropriate research question and poor dissemination of research findings to policy levels.
3. The third key enabling factor is building research capacity of researchers and program managers alike. It ranges from defining the research question to writing up study protocols, seeking funding, collecting and analysing data, and writing manuscripts

8. Barriers to conducting OR and solutions

Barriers: The following are few barriers in conducting operational research:

1. **Lack of knowledge** among academicians and researchers about systematic way of conducting OR (research question is irrelevant, poor adherence of protocol, poor writing skills)
2. Lack of minimal **funding support.** Further, senior managers fear that OR shall use large resources and thus divert resources from existing essential services.
3. Programme managers do not have **research skills** (for protocol development, data analysis and paper writing) and **time** for conducting research as they are occupied with routine programme management.
4. **Poor quality of data** or poorly designed data extraction tools
5. Lack (or non-functional) of **Institute Ethics Committee.**
6. **Lack of co-ordination** between programme managers (or implementers) and researchers.

Solutions: To overcome the barriers stated above, few solutions are suggested as below:

1. **Capacity building of researchers** in institution for designing protocol and paper writing. Develop a pool of researchers trained on OR in institution. They should be provided with a dedicated time (say 1-2 days per week) to develop a protocol after discussion with programme managers, budget; and human resources.
2. **Sensitization of programme managers and policy makers** about OR to allay their fear about large fund requirement for conducting OR. Further, programme managers should be specifically trained on framing a research question and ensuring data quality in the field. A focal point of OR should be there at each level of programme including Ministry of Health.
3. Establishment of a **functional Institute Ethics Committee** in every institution which facilitates research and meet timely (at least monthly).
4. **Regular meetings of academicians/researchers with programme managers.** Involvement of programme managers and policy makers right from beginning of developing protocol to encourage ownership of results.
5. **Collaboration** between research/academic institutions, programme managers (implementers), non-government organizations should be fostered to support OR.

9. Operational Research Priorities in Tobacco Control

OR is generally an integral part of any national programme. Similarly, one of the primary components of National Tobacco Control Programme is promotion of programme based research for informed decision making. The operational research into tobacco control is not new and had laid the foundation of various tobacco control strategies globally.

Lately, Article 20 of WHO Framework Convention on Tobacco Control (FCTC) 2003 states that, inter ilia, the parties should undertake to develop and promote national research and to coordinate research programmes at the regional and international levels in the field of tobacco control[5]. To facilitate its member states in implementing selected measures in the WHO FCTC, WHO introduced the MPOWER package. In the package, there are 6 key elements on which operational research needs to be done. They are Monitor tobacco use and prevention policies (Article 20), Protect people from tobacco smoke (Article 8), Offer help to quit tobacco use (Article 14), Warn about the dangers of tobacco use (Articles 11 and 12), Enforce bans on tobacco advertising, promotion and sponsorship (Article 13), Raise taxes on tobacco (Articles 6 and 15).[6]

At World Health Assembly in 2008, action plan for the Global Strategy for the Prevention and Control of Non-communicable Diseases was endorsed. The objective 4 of the strategy focused on operational and evaluative research where it was emphasized that programmes on non-communicable diseases should be based on scientific evidence, especially in low- and middle-income countries where resources for health are limited and demand is high. In this direction, WHO Department of Chronic Diseases and Health Promotion have put forward series of papers on research priorities in specific health areas, with a particular focus on low- and middle-income countries[7].

It was envisaged that strong local evidence is needed to support the implementation of WHO Framework Convention on Tobacco Control. Although there has been sufficient evidence from high income countries on implementation of tobacco control interventions, there is very little evidence from low and middle income countries, where the use of smoke and smokeless tobacco products is high. It is documented that the highest priority for research in these countries include operational research on the implementation of tobacco taxation and pricing measures; demand reduction issues such as those concerning cessation and dependence; the economic impacts of tobacco use and tobacco control by various MPOWER measures; and determinants of tobacco use. Other includes interrelationships between tobacco use and poverty; counter messages in media to overcome misleading information of tobacco industry; and to identify economically viable options to tobacco growers and manufacturers.[8]

International and national organizations have recognized the importance of OR for tobacco control, and support wide range of projects and issues related to tobacco control, technically and financially. Almost every country in the world has reported research activities related to tobacco control, mostly from developed nations. Strengthening the capacity to plan and conduct OR in low income countries is gradually rising in international agenda.

Most of the research on tobacco control reported in published literature are basic or epidemiological research and only minority being OR. This reflects a lack of expertise, resources or motivation among researchers to conduct OR and also lack of interest on part of journal's editorial board to publish OR papers owing to poorly designed OR or known misconception about lack of scientific rigour of OR[9]. Further, most of OR have been conducted in developed nations, leaving lack of context specific evidence from developing nations, where greatest burden of tobacco exists. The lack of capacity is also due to poor embodiment of OR in programme strategic planning, lack of focal point (person) who is responsible for OR and OR projects do not yield clear and generalizable results to improve programme performance.

Summary

OR should be an integral part of National Tobacco Control Programme. This will strengthen programme activities which lead to improved programme performance. There has been very little commitment in terms of capacity building and resource inputs regarding OR in tobacco control, especially in low and middle income countries, which lead to many unanswered questions to key problems in tobacco control. This results in lack of local contextual evidence

Box 4: Promotion of OR at various levels

- Establish research priorities (based upon constraints to achieve objectives of programme)
- Determine allocation of resources
- Coordination and collaboration between partners and role identification (researchers, managers, international partners, NGOs etc.)
- Capacity building
- Involvement of policy makers and other partners right from planning OR
- Development of global OR database (what is being done and where) and multi-centric OR proposals for addressing issue of generalizability and addressing common challenges.

Case Study 4: PGIMER - The Union OR model Approach to Operational Research

Over the last two decades, there have been many courses to build OR capacity. The few include International Union Against Tuberculosis and Lung Diseases (The Union) and Centers for Disease Control and Prevention, Atlanta, USA; International TB training Course in Japan and The UNION and Medicines Sans Frontiers (MSF). The first two courses produced many research protocols but only few peer reviewed publications. The UNION-MSF course (now popularly known as SORT-IT) started in 2009-2010 by Union Centre for Operational Research and MSFs Brussels Operational Centre, consists of three modules of one week each with clearly defined outputs for each module. The success of each course is judged on basis of measurable product, namely, written protocols and studies followed by submission and publication; post-course involvement of course participant in research training, mentoring, and reviewing papers; and perceived change in policy and practice by their research paper[10]. However, conducting these courses costs a lot in terms of money required, which are often not available in low- and middle-income settings. Further, the course requires investment of time (two modules of one week each, six months for data collection analysis and further one week for writing paper) which is sometime difficult to take out of the busy schedule of program managers. Moreover, most of OR courses have focused on problem of tuberculosis and none have focused exclusively on tobacco control, which is a leading and emerging public health problem. Post Graduate Institute of Medical Education and Research, Chandigarh and The Union, New Delhi had tested a new model (k/a PGIMER-The Union OR model) in 2014, wherein, they designed a course which is abridged version (5 and ½ days) of previous models. The selection of 9 facilitators and 15 participants along-with allocation of mentors (facilitators) to participants were done one month prior to actual course. This e-mentoring facilitated finalization of research question and analysis prior to actual attending the course. The course analysed upon 15 research questions from Global Adult Tobacco Survey 2009-2010. This model was less costly, used existing resources, less on investment of time and focused exclusively on tobacco control.

leading to poor advocacy and policy paralysis. For effective implementation of OR, a national and international collaborative network on different areas of tobacco control should be established, the locally relevant research questions should be identified, and funders should be encouraged to invest in neglected but important area. This will assist in facilitating evidence based research and its application in improving efficiency and effectiveness of tobacco control programme.

Unit Review Questions

1. What is Operational Research? Enumerate the salient features of OR, which differentiates it from other approaches of research.
2. Enlist the priority areas of Operational Research in Tobacco Control.
3. What are the common barriers in conducting OR? Also enlist the solutions to overcome the barriers.

Application question (s)/ Assignment

1. Plan an Operational Research in National Tobacco Control Programme in your area. Discuss the steps in conducting the same.
2. Discuss the barriers and enabling factors in your institution for conducting OR. How will you counter the barriers?

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