

Review Article: Cancer Trends in Asia

Cancer Control in Bangladesh

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Cancer is predicted to be an increasingly important cause of morbidity and mortality in Bangladesh in the next few decades. The estimated incidence of 12.7 million new cancer cases will rise to 21.4 million by 2030. More than two-thirds of the total expenditure on health is through out-of-pocket payments. According to the Bangladesh Bureau of Statistics, cancer is the sixth leading cause of death. International Agency for Research on Cancer has estimated cancer-related death rates in Bangladesh to be 7.5% in 2005 and 13% in 2030. The two leading causes are in males are lung and oral cancer and in females are breast cancer and cervical cancer. Bangladesh is now in severe shortage of radiation therapy machines, hospital bed, trained oncologists, medical radiation physicists and technologists. Bangladesh having different cancers associated with smoking and smokeless tobacco use, Human papilloma virus infection, Hepatitis B and C infection, *Helicobacter Pylori* infection, arsenic contaminated groundwater, availability of chemical carcinogens mainly formalin treated fruits, fish and vegetables at open market, tannery waste contaminated with chromium (which is used for poultry feed and fish feed preparation). A World Health Organization study revealed the annual cost of illnesses in Bangladesh attributable to tobacco usage is US\$ 500 million and the total annual benefit from the tobacco sector is US\$ 305 million as tax revenue. Bangladesh has developed a National Cancer Control Strategy and Action Plan with the aim of delivering a universal, quality-based and timely service. Cancer prevention through tobacco control, health promotion and vaccination program, cancer early detection program for oral cavity, breast and cervix has initiated. Cancer detection and diagnostic facilities will be made available at medical colleges and district-hospitals and establish a referral chain. National capacity development, more cancer research will allow Bangladesh to deal effectively and efficiently with the cancer problems through evidence-based decision making.

Key words: cancer control – Bangladesh

PREFACE

Cancer is predicted to be an increasingly important cause of morbidity and mortality in the next few decades, in all regions of the world. The forecasted changes in population demographics in the next two decades mean that even if current global cancer rates remain unchanged, the estimated incidence of 12.7 million new cancer cases in 2008 will rise to 21.4 million by 2030 (1).

There are 13 to 15 lakh cancer patients in Bangladesh, with about 2 lakh patients newly diagnosed with cancer each year (2). In the coming years, the increase in population and longevity will result in an increase in the number of cancer patients in Bangladesh. When combined with population aging, the increase in cancer prevalence is inevitable. Keeping pace with the demand will require a major government commitment to cancer prevention and curative services in the



Figure 1. Map of Bangladesh.

coming years. The aim is to control major risk factors and deliver a universal, quality-based and timely service, in line with the best practices that are currently available in South-East Asian countries (3).

COUNTRY SKETCH

Bangladesh is one of the world's most densely populated countries, its people residing in the delta of rivers that empties into the Bay of Bengal, prone to devastating floods.

Bangladesh (Fig. 1) has been ravaged by economic and environmental disasters since its hard-won independence from Pakistan in 1971. Only recently has the country begun to emerge as a fragile, but functioning, parliamentary democracy, relatively self-sufficient in food production and with an economy that has been consistently achieving growth. The combined natural calamities and geo-political factors have contributed to the nation's struggle for any significant development strides.

DEMOGRAPHICS

Bangladesh is the country with the highest population density worldwide. The current population of Bangladesh is 153.6 million with the growth rate of 1.37% (4). Sixty-one percent of the population is in the 15–64 years age group, and the ratio of elderly to working age people is increasing substantially in Bangladesh.

With Dhaka, the fastest growing city in Asia, Bangladesh is undergoing rapid urbanization. The 28% urban population is growing at 3.1% and stretching the scarce resources (5).

ECONOMIC AND DEVELOPMENT TRENDS

There has been an increase in gross domestic product (GDP) per capita from US \$ 559 in 2007 to US \$ 838 in 2013 (4). Nonetheless, 63 million people continue to live below the poverty line. Between 1980 and 2012, Bangladesh's Human Development Index (HDI) value increased from 0.312 to 0.515, an increase of 65.0% positioning the country at 146 out of 187 countries and territories (6).

DISEASE SILHOUETTE

Bangladesh has been battling the combined burden of communicable and nutritional health hazards for history. The national programs and policies have been focused on the infectious and parasitic diseases and maternal and child health. The governmental interventions and demographic transition will see an epidemiological transition that will shift the pattern of disease, where the non-communicable diseases will be the overriding burden (7).

POLICY DEVELOPMENT

The government has been pursuing a policy of health development that ensures provision of basic services to the entire population since independence, particularly to the underserved population in rural areas. The successive health plans of the country emphasize Primary Health Care as the key approach for improving health status of the people (8).

Health and Population Sector Strategy is the cornerstone of national health policy introduced in 1998. Priority is given to ensuring universal accessibility to and equity in healthcare, with particular attention to the rural population. Maternal and Child Health and reproductive health receive priority in the public sector in the government financial allocation for health (9).

HEALTH SKELETON OF BANGLADESH

Since 1998, a sector-wide approach has been pursued by the Government of Bangladesh for improving effectiveness of the public sector interventions and for providing services responsive to the needs and demands of the population. The initial Health and Population Sector Program of the period 1998–2003 was replaced later by Health, Nutrition and Population Sector Program (HNPS) in 2003–10. The Ministry of Health and Family Welfare designed the Program Implementation Plan for HNPS which covers 38 operational plans to be implemented by 38 line directors (7).

To revitalize Primary Health Care services, the present government has taken steps managed by a Community Clinic Management Group which includes local public leaders and

representatives. A quick assessment of the community clinics, supported by world Health Organization (WHO) in 2009, showed that with the expansion of the health-care facilities to the peripheral level, the distribution of health-care inputs and their utilization became more equitable and the utilization rate of these facilities was almost universal.

In the public sector, Upazila (sub district) health complexes, and district hospitals, are providing curative care at primary and secondary levels, respectively. Tertiary-level curative care is mostly provided at national and divisional levels through large hospitals affiliated with medical teaching institutions. Improvement in the access of the population to quality services according to the need and demands is a difficult challenge to be addressed by the government (7).

HEALTH PERSONNEL

Bangladesh has managed to develop nation-wide network of medical colleges, nursing and paramedical institutes. There are 59 medical colleges (41 private), 13 nursing colleges (7 private), 69 nursing institute (22 private), 17 medical assistant training schools (10 private) and 16 institutes of health technology (13 private) (7).

The nurse–doctor and medical technologist–doctor ratios are among the poorest in the world and among the SEAR nations. While the majority of people live in rural areas, the majority of health professionals work in urban areas (7).

The rapid growth of the private sector in medical education necessitates a more stringent regulatory function to be performed by the government. There is also a growing recognition of the need for regulatory bodies for health professionals to ensure the quality of health workforce education and practices (7).

HEALTH METRICS

Regular and timely publication of health bulletin, modernization of the data collection and storage system, publication of health information system (MIS), assessment report using Health Metrics Network assessment tools are initiatives taken by the government to improve Health Information System in the country, which need coordination between different units and agencies to make the system comprehensive, effective and more reliable (7).

MEDICAL PRODUCTS

Currently, ~97% of the overall local demand for drugs and 100% of that for the essential drugs are met from the local production. Bangladesh exports to 76 countries in 2009 amounted to approximately USD 49 million, demonstrating value in cost and quality. The Ministry of Health and Family Welfare updated the National Drug Policy in 2005. Repeated assessments have been conducted to improve the capacity of the Directorate General of Drug Administration, to effectively function as National Regulatory Authority (7).

HEALTH FINANCING

Historically, supply-side financing of health-care services has been the backbone strategy for improving the access of poor households to essential health-care services. More than two-thirds of the total expenditure on health is privately financed, through out-of-pocket payments. Of the remaining one-third (public financing), ~60% is financed by the government out of tax revenues, development outlays, and the remaining 40% through international development assistance. A few NGOs have started a health insurance component within their package of micro-credit program (7).

In Bangladesh, ~3% of GDP is spent on health, out of which the government's contribution is ~1.1% (7). In 2010, Bangladesh spent 3.5 billion US \$ on healthcare, and 64% was out-of-pocket expenditure by households. The total \$23 per capita spending, though doubled over a decade, is among the lowest in the SEAR countries. The health share of domestically funded government expenditure is 1.8% and General government expenditure on Health (GGHE) as % of general government expenditure is 8.9% (3) (Table 1). In terms of dollar, the total health expenditure in the country is about US\$ 12 per capita per annum, of which the public health expenditure is only around US\$ 4 only.

Top 20 causes of deaths in Bangladesh from the Health & Demographic Survey 2008, BBS

- (i) Old age complications
- (ii) Asthma/COPD
- (iii) Fever
- (iv) Heart disease
- (v) Accident and injuries
- (vi) Tumor/Cancer
- (vii) Diarrhea
- (viii) Jaundice/Liver disease
- (ix) Tuberculosis
- (x) Tetanus
- (xi) Malnutrition
- (xii) Chicken Pox, Measles, Polio
- (xiii) Rheumatic fever
- (xiv) Appendicitis, Kidney problem
- (xv) Paralysis
- (xvi) Diabetes
- (xvii) Pregnancy related problems
- (xviii) Mental illness, Drug abuse
- (xix) Peptic ulcer
- (xx) Abortion problem

THE CANCER BURDEN IN BANGLADESH

INCIDENCE AND BURDEN OF CANCER

Within the low-income countries, the absolute burden of cancer is much lower in comparison with the high-income countries and while lung and breast cancers remain among the most common diagnoses and types of cancer-related deaths.

Table 1. Bangladesh—National Expenditure on Health

Selected ratio indicators for Expenditure on Health (BDT)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Health share of domestically funded government expenditure	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.1	1.1	1.2	1.1	1.6	1.8	1.8
General government expenditure on Health (GGHE) as % of general government expenditure	8.8	9.0	8.7	8.6	8.1	7.6	8.1	8.2	7.9	8.2	7.5	8.4	8.4	7.4	9.7	8.9	8.9

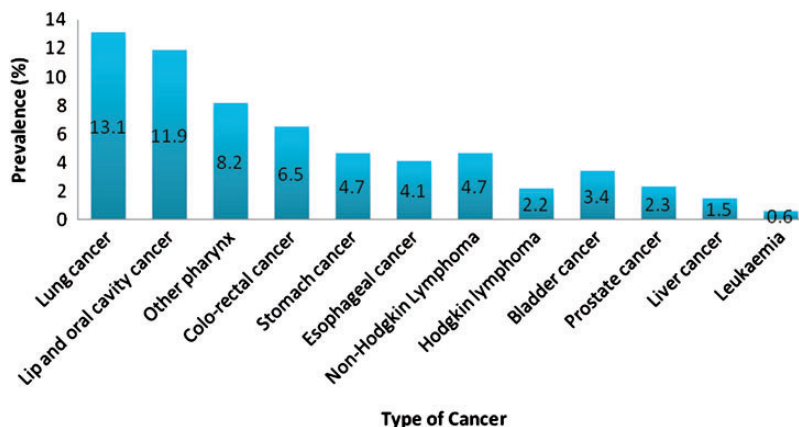


Figure 2. Prevalence of cancer in males in the last 5 years.

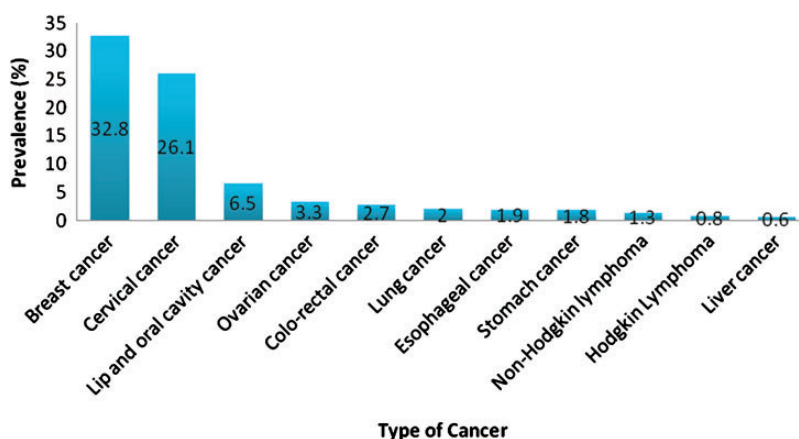


Figure 3. Prevalence of cancer in females in the last 5 years.

Cancers of the cervix, stomach and liver are also among the leading types.

According to Bangladesh Bureau of Statistics cancer is the sixth leading cause of death in Bangladesh (BBS, 2004). Hospital-based cancer registry has been started at National Institute of Cancer Research Hospital (NICRH) and Oncology Department of Bangabandhu Sheikh Mujib Medical University (BSMMU) (10). International Agency for Research on Cancer (IARC) has estimated cancer-related death rate in Bangladesh to be 7.5% in 2005 and it will be increase to 13% in 2030.

IARC (2008) has identified that the 10 leading causes of deaths from cancer in males are lung, mouth and oro-pharyngeal, esophageal, pharynx, stomach, larynx, colorectal, lymphoma, liver and bladder cancers (Fig. 2) and in females are mouth, cervical, breast, oro-pharyngeal, lung, esophageal, gallbladder, stomach, ovary, liver and colorectal cancers (Fig. 3). A recent WHO study estimates that there are 49 000 oral, 71 000 pharynx and laryngeal and 196 000 lung cancer cases in Bangladesh among those aged ≥ 30 years. The same study observed that 3.6% of the admissions in medical college

hospitals for the same age group are due to cancers of oral cavity, larynx and lungs. Oral, breast and cervical cancers together constitute >43% of the female cancer burden in Bangladesh (10). Lung cancer in males and cervical and breast cancers in females constitute 38% of all cancers in Bangladesh.

The NICRH and BSMMU cancer registry data revealed that 60% of the cancers in the male and 5% of the cancers in female are tobacco related and hence entirely avoidable (11).

The NICRH and BSMMU cancer registry data revealed that >66% of the cancers occur in the age group of 30–65 years. 20–25% of the cancers are diagnosed in a localized stage. The majority of the cases are diagnosed when the disease is regional (two-third of all cases). Disease with distant metastasis at the time of diagnosis is <15% (10).

Although childhood cancers represent only 1% of the overall incidence of the disease, the successful treatment of cancers occurring in young people results in considerable saving of years of life. Seventy percent of childhood cancers are curable, but one-half of the survivors have long-term sequel. Adolescents with cancer have poorer survival than children cancer. The commonest five cancers in children are leukemia, lymphomas, central nervous system tumors, soft tissue sarcomas and renal tumors (10).

TREATMENT FACILITIES

According to the International Atomic Energy Agency (IAEA) per 1 million population needs 2 Teletherapy machines and 1 Brachytherapy machine. According to this estimation, it was found that only Dhaka city needs 20 and the country needs around 300 teletherapy (radiotherapy) machines.

However, in Bangladesh there are 17 radiotherapy centers in public and private sectors; only one is situated in a rural area. There are only 15 linear accelerators installed in the country where two are installed in the rural area. Twelve cobalt-60 machines and 12 brachytherapy machines are installed in Bangladesh.

Bed capacity is around 500 all over the country, insufficient for the current and future needs (10). Among these, 64 beds are for day care and remaining are in indoor facility. Recently, the government of Bangladesh updated the list of essential drug as per the WHO guidelines but the drugs are yet to be made available for the patient population. To improve the availability and access to anticancer drugs, the government may need to provide incentive for indigenous production or invite South Asian Association for Regional Cooperation collaborations to use the regional expertise.

HUMAN RESOURCE DEVELOPMENT FOR CANCER MANAGEMENT

In 2008, a study commissioned by American Society of Clinical Oncology predicted that by the year 2020, there will be 12 500 oncologists in America providing one oncologist

for every hundred patients. In contrast, Bangladesh has a ratio of 1 per 10 000 patients and neighboring India is better off at 1 per 1600 (2). Similarly, for delivery of optimal cancer care all elements of the multidisciplinary teams need to be trained to provide care for the patient population of urban and rural Bangladesh.

In Bangladesh, there is a severe shortage of trained oncologists and physicists (10). Oncopathology and cytopathology skills need to be enhanced for better delivery of cancer care. Technical staff for tissue diagnosis and imaging modalities also needs to be developed. The training requirements need to be assessed and optimum training provided to develop comprehensive and balanced services in a reasonable time frame.

TOBACCO

Tobacco is the single most important modifiable risk factor for cancer. Unfortunately in Bangladesh, cigarette production has grown tremendously since 1980, and bidi production has grown even faster (10).

Health education including anti-tobacco, prevention of cancer, early signs and symptoms of cancer in easy languages needs to be introduced in schools and colleges up to High School level including madrasahs. The undergraduate medical curriculum should incorporate comprehensive fundamental oncology instruction (10).

A WHO study shows that 20 million people in Bangladesh use tobacco in some form, and including 5 million women and 57 000 people die every year due to tobacco-related diseases (10). The prevalence of smoking in Bangladesh is 41% among men aged ≥ 15 years (50.1% among men aged ≥ 30 years). It was 1.8% among women aged ≥ 15 years (3.1% among women aged ≥ 30 years). In addition, 14.8% of men aged ≥ 15 years (22.4% of men aged ≥ 30 years) and 24.4% of women aged ≥ 15 years (39% of women 30 years and older) currently use smokeless tobacco in chewable form such as jarda and sadapata with betel leaf and betel nut, *etc.* Altogether, 62% of men and 41% of women (52% sex combined) aged ≥ 30 years were found to either smoke or chew tobacco at the time of the survey (12). Data from these surveys indicate that the prevalence of tobacco use is higher among males than among females and among older age groups than younger age groups.

Nearly half of the school students and nearly four-fifth of the health students are exposed to second-hand smoke in Bangladesh. The eight tobacco-related diseases (ischemic heart disease, lung cancer, stroke, oral cancer, cancer larynx, chronic obstructive pulmonary disease, pulmonary tuberculosis and Buerger's disease) are responsible for 16% of all deaths among the people aged 30 and 9% of all deaths in the population over 30 are attributable to tobacco (10).

SEXUAL AND REPRODUCTIVE FACTORS

Sexual and reproductive factors are associated with cancer of the uterine cervix and breast. Sexual behavior factors, like

young age at first sexual intercourse, multiple sexual partners and poor sexual hygiene, are associated with cancer of the uterine cervix. Human papilloma virus (HPV) has now been identified as the etiological agent responsible for cervical cancer. Bangladesh has the highest level of incidence and mortality rates due to cervical cancer among women. The prevalence of cervical cancer in Bangladeshi women has been reported to be 25–30/100 000 (13).

DIET

WHO has expressed its anxiety about the impact of food safety on public health in Bangladesh in its website. It reveals that unsafe food can be a significant reason for many chronic and non-chronic diseases, including but not limited to diarrhea, cancer, heart diseases, various kidney diseases and birth defects. In Bangladesh, most of the foodstuffs, whether manufactured or processed, are unsafe for consumption or adulterated to varying degrees.

Formalin use in foods is a crucial problem in Bangladesh currently. Formalin-treated fruits, fish and vegetables are being openly sold in supermarkets to keep these foods fresh. Scientific scholarships suggest that consumption of formalin directly through food can cause different types of cancers, especially lung cancer (14).

Dichlorodiphenyltrichloroethane (DDT) is commonly used in dried fish (locally called as 'sutki') processing in Bangladesh. Usage of DDT is a significant reason for cancer, especially breast, liver and pancreatic cancers. Its use is prohibited in 49 countries and restricted in 23 countries around the world. Bangladesh also banned application of DDT, but unfortunately its use remains rampant.

Toxic unauthorized food colors, especially textile dyes, are used in food, manufacturing and processing in Bangladesh. Various types of sweets and some cultural foods named beguni, peajuare also adulterated by textile dyes. Research suggests that the toxic colors in food can create cancer, indigestions, allergies and asthmas (14).

The puffed rice (locally known as 'moodi') is contaminated by using urea fertilizer to make it white and bigger in size. Urea is extremely hazardous for human body, which can create cancer and various types of ulcers (14).

INFECTION

HPV infection is one of the most common sexually transmitted diseases worldwide. Up to 70% of sexually active women worldwide could become infected with HPV during their lifetime. The prevalence of HPV infection among women in Bangladesh has been reported to be 4.1% (13). HPV infection can be prevented by safe sexual practices avoiding multiple sexual partners and vaccination with HPV (10).

The prevalence of hepatocellular carcinoma (HCC) in Bangladesh is 35% among all liver diseases. A study demonstrates at least 61% association of HCC with hepatitis B

infection. The prevalence of hepatitis C is quite low (0.8%) in healthy population (15). Prevention of this infection is possible with universal precautions, safe sexual practices, and vaccination for hepatitis B (10).

Gastric carcinoma as well as other gastric malignancies are increasing day by day in Bangladesh. *Helicobacter pylori* (*H. pylori*) is an important contributing factor in this increasing trend of gastric malignancies. The prevalence rate of *H. pylori* infection in Bangladesh has been reported to be at 92% (16). *H. pylori* infection can be prevented by treating the patients with symptomatic infection (10).

Epstein-Barr Virus (EBV) causes Burkitt lymphoma and nasopharyngeal carcinoma (10). In a study, it was found that the prevalence of EBV infection in Bangladeshi population is similar to that observed in other developing countries (17).

WATER POLLUTION

The contamination of groundwater by arsenic in Bangladesh is the largest poisoning of a population in history, with millions of people exposed. Long-term effects of exposure to arsenic in the case of cancer are mainly skin cancer and others are bladder, kidney and lung cancers (18).

Hexavalent chromium (Cr-VI) is a dangerous toxin. Since 1990, international health authorities have identified it as a known human carcinogen when inhaled (IARC 1990), and a growing body of evidence has linked hexavalent chromium in drinking water to stomach and gastrointestinal cancers (19). Solid tannery waste from the Hazaribagh area in the outskirts of Dhaka, Bangladesh, is used as the principal component of poultry feed, fish feed and fertilizers. It was found in the study that the amounts of Cr(VI) are significantly higher in six of the poultry samples (20). Common people regularly have these fish, chicken and duck. Therefore, chromium enters the body and causes cancer.

ECONOMIC IMPACT OF CANCER

The economic impact of cancer affects individual households and the public health economy. Two Hospital-based Cancer Registries in Bangladesh showed that 66% of the cancer patients are in the age group 30–65 years, the main workforce structure of a country. A WHO study revealed the annual cost of illnesses in Bangladesh attributable to tobacco usage to be 50.9 billion taka (US\$ 500 million considering that only a quarter of the patients with tobacco-related illnesses receive hospital care). On the other hand, the total annual benefit from the tobacco sector is estimated to be 24.8 billion taka (US\$ 305 million) as tax revenue on the domestic consumption of tobacco (20.3 billion taka) (US\$ 244 million) and wages in tobacco production (4.5 billion taka) (US\$ 55 million). The expenditure on tobacco-related illnesses thus outweighs the benefit from revenue and wages (10).

Bangladesh is not able to provide the latest treatment facilities for cancer management and hence government's support

is inadequate. Every year Bangladesh is losing a huge amount of foreign currency for this purpose. The overall cancer management could reach the South-East Asian regional level if the government would invest one quarter of this amount for the next 4 years (10).

PRIMARY PREVENTION ACTIVITIES

Health Promotion: Primary Preventive Measures are being carried out for health promotion through following actions:

- (i) Community cancer support group formation at district level, local level and utilization community clinic
- (ii) Education on early warning signals, motivation for physical examination
- (iii) Propagation of warning signals, breast self-examination, mouth self-examination
- (iv) Involvement of scouts and girl guides in cancer prevention activities
- (v) Introduction of lesson on cancer warning signal in secondary and higher secondary school curriculum
- (vi) Media personnel training on appropriate publicity for the National Cancer Control Program
- (vii) Poster, video, flip chart, radio spot preparation
- (viii) Development of cancer prevention training module for facilitators and health professionals
- (ix) Development of training module on cytology and palliative care (10).

Vaccination program: following vaccination programs are going on:

- (i) Hepatitis B immunization for preventing liver cancer
- (ii) Cervical cancer vaccination program to prevent cervical cancer
- (iii) Scaling up of cervical cancer vaccination program to prevent cervical cancer
- (iv) Hepatitis C control for preventing liver cancer (10).

Tobacco control interventions:

- (i) Enforcement of tobacco control legislation
- (ii) Enforcement of Tobacco smoking ban at public places, work places, public transport
- (iii) Increased tax on tobacco products
- (iv) Campaign for tobacco-free homes
- (v) Opinion leaders workshop on tobacco and Cancer program
- (vi) Consultative meeting for collaboration with reproductive health, NASP and other related programs
- (vii) Doctors against tobacco activities
- (viii) Tobacco Cessation clinic-establishment
- (ix) Introduction of lesson on the harmful effect of tobacco in the secondary school curriculum (10).

Alcohol Control Intervention: Prevention of alcohol intake program is going on by increasing Tax Level and Coverage.

Physical activity promotion: To prevent cancer regular physical activity is very important. Thus, physical activity

promotion is being carried out by promoting bicycles, footways for walking and public transport.

Preventing occupational cancers:

- (i) Including sun protection interventions
- (ii) Arsenic-induced cancer.

Nutrition interventions: promoting fruits and vegetables

Anti-food adulteration campaign and Law updation are also going on.

Formation of Cancer Survivor's Forum is another preventive measure (10).

EARLY DETECTION AND SCREENING PROGRAMS

As part of cancer control strategy following programs are continuing at different places:

- (i) Early detection of oral/breast/cervical/other cancers
- (ii) Training on collection of Pap Smear, visual inspection of cervix
- (iii) Teaching of mouth self-examination and breast self-examination
- (iv) Training technologists on Cytology, Pap smear, VIA, Cervicoscopy and staining of cytology smears
- (v) Training on opportunistic examination of cervical, oral, breast, GIT, lung, prostate and other common cancers
- (vi) Training general medical practitioners on cancer-related physical examination (CRPE) and biopsy
- (vii) Training dental surgeons, gynecologists and surgeons on CRPE
- (viii) Histo and cytopathology
 - (a) Training on cytopathologists (2 weeks)
 - (b) Paramedics (3 months)
 - (c) Training on cytotechnicians (4 months)
- (ix) Establishment of Tumor Board in Government Medical College Hospitals/NICRH/BSMMU
- (x) Training govt. health workers, NGO workers for Oral, breast and cervical cancer detection
- (xi) Establishment of Early Cancer Detection Center (ECDC) at Medical College Hospital/NICRH/BSMMU.
- (xii) Establishment of Cancer Prevention and Detection Centers at district hospital
- (xiii) Screening of cervical and breast cancers (10).

RESEARCH AND SURVEILLANCE PROGRAM

Cancer Registry: To establish cancer registry the following activities are performed.

- (i) Assessment of burden of cancer in Bangladesh and development of Cancer Atlas
- (ii) Initiation of hospital-based cancer registry at oncology/radiotherapy department at all Govt. medical college hospitals

- (iii) Continuation of hospital-based cancer registry at NICRH and Oncology Department, BSMMMU
- (iv) Population-based cancer registry at Gazipur
- (v) Initiation of population-based cancer registry at North Motlab, Chandpur and Mirsari, Chittagong
- (vi) Initiation of population-based cancer registry at all oncology/radiotherapy departments of govt. medical college hospital.

Research: Following research programs are going on.

- (i) Epidemiological, laboratory, clinical and health system researches
- (ii) Training to develop adequate manpower (10).

CANCER PROGRAMS

Several organizations are working to fight against cancer for the optimum well-being of the cancer patients. Some programs that have taken place are as follows:

- (i) Breast Cancer Identifying and Treating Project; Amader Gram an ICT4D (Information and Communication Technologies for Development) initiative of Bangladesh.
- (ii) The Government of Bangladesh, with support from UNFPA (United Nations Fund for Population Activities), has taken initiatives to develop a cervical and breast cancer screening program in Bangladesh.
- (iii) International Childhood Cancer Forum: exploration and setting priorities for an unmet need in Bangladesh.
- (iv) The Bangladesh Women Chamber of Commerce and Industry has committed to Every Women Every Child to raise awareness of cervical cancer.
- (v) Cancer Support Society (CANSUP), an NGO in Chittagong, is working on breast self-examination and cervical cancer screening with technical assistance from the WHO.
- (vi) Gonoshasthaya Kendra is heading toward establishing a cancer hospital for the poor. Government already has acquired a land and Gonoshasthaya Kendra has started to mobilize resources and is requesting the philanthropists and donors to come forward in establishing the cancer hospital for the poor adjacent to Savar campus.
- (vii) ASHIC Foundation for childhood cancer improves the quality of life for children living with cancer in Bangladesh by providing hope, physical and emotional support, and raising public awareness for early detection, improved treatment and social acceptance.

THE BANGLADESH CANCER CONTROL STRATEGY

Although cancer, diabetes, cardiovascular disease and chronic obstructive pulmonary disease (NCD) has been considered as a problem of the affluent, 80% of this burden is borne by low-to middle-income countries like Bangladesh. To combat this

enormous threat, information dissemination on all the aspects of NCDs and their risk factors is a vital element in the Government's strategy to deal with NCDs in Bangladesh. The NCD risk factor survey in Bangladesh-2010 will serve as an important source of data in this regard (21). Around 99% of the surveyed population in Bangladesh has at least one risk factor for developing NCDs is revealed by the recently concluded NCD risk factor survey 2010. This survey provides essential information on key indicators of NCD risk factors and creates an opportunity for the policy makers, program managers and researchers to adopt innovative interventions.

The fact sheet pointed that there is hardly anyone in the population without a risk factor. Around 98.7% of the survey population has at least one risk factor of NCD, around 77% had two or more risk factors and around 28.3% had three or more risk factors. More women were found to have three or more risk factors than men.

The cancer control strategy is the first step in the development and implementation of a comprehensive cancer control program in Bangladesh. This strategy has been designed to be consistent with the needs and expectations of the people of Bangladesh, and to enable the doable goals of development and improving health (10).

STRATEGY IN THE CONTEXT AND DEVELOPMENT PROCESS

Bangladesh is a signatory of WHO resolution on cancer prevention and control, which urges the member states to develop and implement a national cancer control strategy for reducing the incidence and impact of cancer.

A cancer control plan has been developed in 1992 by Bangladesh cancer society. A consensus workshop has been organized by NICRH on the development of National Cancer Control Plan with the support of WHO in 2005 for the first time (10).

The government formulated 'National Non-Communicable Diseases Strategy and Plan of Action' and 'National Cancer Control Strategy and Plan of Action in 2007 with the help of the technical support from WHO and committed to develop 'National Cancer Strategy and Plan of Action' in HNPSP and RPIP (2003–10) (10).

NATIONAL CANCER CONTROL STRATEGY AND PLAN OF ACTION 2009–15

The aim is to deliver a universal, quality-based and timely service, in line with the best that is currently available in the world (10).

VISION

Bangladesh envisages a system of cancer control, which will reduce cancer morbidity and mortality rates relative to the South-East Asian Regional standard by 2015. Bangladeshi

people will know and practice health promoting and cancer-preventing behaviors and will have increased awareness of and access to early cancer detection and screening (10).

The aim of the strategy is to reduce the morbidity and mortality of cancer through primary prevention, early detection and effective diagnosis and treatment. The strategy includes early detection and minimal therapy at the periphery and early detection and comprehensive multidisciplinary protocol-based therapy at the oncology/radiotherapy department of medical colleges and palliative care at all level. Rehabilitation and palliative care will be strengthened and continuum of care will include home care. Research to generate essential evidences for effective cancer control is another important aspect (10).

IMPLEMENTATION

The implementation is spearheaded by the national council tasked with the preparation of a cancer control plan at the national, division and district level with the consideration of socio-cultural factors, economy, health infrastructure, health priorities and availability of human resources.

The plan includes formulation of a district cancer control committee, which will be the channel for delivery of cancer control at the grass root level. Cancer technical groups of the medical college cancer center will function as a resources center for preparation of the cancer control plan and human resource development. Cancer registries are envisioned at all Oncology/radiotherapy departments to accurately assess the countrywide database on cancer and to monitor cancer morbidity.

To channel the cancer service delivery, National Cancer Control Council (NCCC) will be formed and headed by Hon'ble Health Advisor/Minister in charge of Ministry of Health and Family Welfare. This council will formulate the policy-related matter and will oversee and support cancer control activities throughout the country.

A cancer control taskforce will be formed with Directorate General of Health Services (DGHS) to implement the National Cancer Control Strategy and Plan of Action 2009–2015 through Medical College Cancer Control and District Cancer Control committees and different agencies. This taskforce will also coordinate the work of all agencies that contribute to cancer control in the country. In addition, they will identify and recommend priorities to National Cancer Control Council.

A cancer control committee will be formed at medical college/university hospital to implement the activities according to the National Cancer Control Strategy and Plan of Action, 2009–2015.

A District Cancer Control Committee will be formed at district level. They will establish a cancer control cell at the district hospital and coordinate cancer control and prevention activities in the district. The committee will send an activity report to cancer control Taskforce, DGHS, at every 2 months interval.

Through these committees eventually the cancer service will be delivered to the community.

THE STRATEGY AND ACTION PLAN

PRIMARY PREVENTION FEATURES

- (i) A bulk percentage of cancer related to tobacco use can be prevented to a large extent through a comprehensive tobacco control program, which will include awareness, education, legislation, community participation and tobacco cessation services.
- (ii) Health promotion programs for a healthy lifestyle, eating plenty of fruits and vegetables, have been considered for inclusion.
- (iii) Vaccination strategies for cancers related to infectious agents such as human papilloma virus for cervical cancer and hepatitis B virus for liver cancer (10).

EARLY DETECTION

- (i) The common cancers of the oral cavity, breast and cervix are identified as targets for early detection and control by awareness campaigns of the common signs and symptoms.
- (ii) Early warning signals of these cancers are propagated widely cytology facilities at district level.
- (iii) Screening for cervical cancer and cancer of breast (10).

DIAGNOSIS AND TREATMENT/REFERRAL

- (i) Cancer detection and diagnostic facilities are envisioned to be accessed at medical colleges and district-level hospitals with a clear referral chain to ensure optimal care at appropriate levels.
- (ii) Management of pediatric cancers is planned at dedicated centers (10).

PALLIATIVE CARE

- (i) Palliative care should be treated as an integral part of cancer management.
- (ii) Morphine availability will be ensured for better pain management (10).

CANCER SURVEILLANCE AND MONITORING

- (i) The cancer registry program is to be expanded and be made the monitoring component of the cancer control program.
- (ii) Hospital-based cancer registry program will be expended all over Bangladesh with the support of WHO and HNPS.
- (iii) Population-based cancer registry is started at by Cancer Foundation at Gazipur with the support from WHO (10).

CAPACITY BUILDING

Human resources can be mobilized for prevention and early clinical detection activities through suitable strategies and training programs from the government, health workers, community, NGOs, youth organizations, multi-sectoral groups, professional organizations, etc. A broad range of categories

have been identified at all levels of implementation to support the varied interventions for education, and awareness as well as technical staff to support early detection and optimal management by healthcare personnel (10).

IMPLEMENTATION INSTRUMENT

According to the program recognition of prevention, early detection and palliative care services are to reach the grass route level, apart from utilizing the existing health infrastructure, the participation of the community, NGOs, media, people's campaigns integrated with other institutional programs are all essential.

To implement cancer control, political commitment is a vital component. Social commitment plays another important role in executing cancer control in Bangladesh. Approach from multi-sectoral groups will strengthen the implementation activities and will help performing the actions smoothly. Capacity and committed institutes are major priorities of a successful cancer control program. Through suitable strategies and training programs human resources can be mobilized for prevention and early clinical detection activities from the government healthworkers, community, NGOs, youth organizations, multi-sectoral groups, professional organizations, etc. Utilization of such man power will give cost effective and efficient service as they will be more committed. Technical guidance is another key component of cancer control in Bangladesh. Technical personnel required for early cancer detection are medical professionals and cytopathologists. The cancer control program in Bangladesh will never take off if this aspect of human resource development is ignored. Hence, immediate need is to train adequate number of cytopathologists and cytotechnicians annually.

CONCLUSION

The worldwide burden of cancer could be prevented in a significant proportion through the application of existing cancer control knowledge, and by implementing programs for tobacco control, vaccination (for liver and cervical cancers) and early detection and treatment, as well as public health campaigns promoting physical activity and healthier dietary preferences and lifestyles.

The principles of cancer control have been incorporated by the Bangladesh cancer control program. This program has laid the foundations for an effective plan to combat the problem. While tobacco control remains the keystone of a successful strategy, there is a need for implementing the tobacco legislation as well as a robust government policy on the production, promotion and use of tobacco. Encouraging smoking cessation and discouraging the habit will need widespread and continuous education and dedicated risk awareness. The pricing and taxation structure must also contribute to the development of a social climate in which smoking is unacceptable.

Early detection is best when supported by a strong network cancer pathway, such that every patient has access to the right intervention in a convenient and affordable manner.

As part of the national cancer control program, the development of a treatment and management policy requires the establishment of national evidence-based guidelines, including follow-up policy as well as targets to measure progress, collection of data to measure outcomes with a focus on common early detectable tumors and or those with high potential for cure

The availability of drugs at affordable costs is another challenge, which can be regarded as surmountable with thoughtful attention for developing indigenous molecules.

Bangladesh will need to strengthen the infrastructure for delivery of care, facility development and decentralize the points of care for equitable distribution of the resources and target high coverage of patients through services provided mainly by home-based care.

When the available resources are extremely limited, there is no room for inefficient approaches or misuse of available funds. Health insurance is one of the alternate financial policy directions that need immediate attention.

In Bangladesh, research studies to determine the most cost-effective cancer control strategies are especially relevant. National capacity development should be especially encouraged for cancer research to allow Bangladesh to deal effectively and efficiently with their own cancer problems through evidence-based decision-making.

Conflict of interest statement

None declared.

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