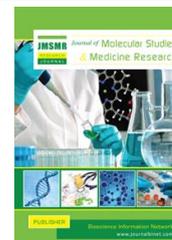


Published with Open Access at **Journal BiNET**

Vol. 06, Issue 01: 193-199

Journal of Molecular Studies and Medicine ResearchJournal Home: www.journalbinet.com/jmsmr-journal.html

A comprehensive Cervical Cancer Control Plan in a low-middle income country: Bangladesh perspective

Mousumi Baishnab¹ and Titas Roy²¹Dhaka Medical College, Dhaka-1000, Bangladesh.²Dept. of Neurosurgery, Faculty of Surgery, Dhaka Medical College Hospital, Dhaka-1000, Bangladesh.✉ For any information: baishnabk65@gmail.com (Baishnab, M.).

Article received: 12.07.2021; Revised: 28.11.2021; First published online: 20 December 2021.

ABSTRACT

Carcinoma cervix is one of the most important preventable and curable diseases of women of reproductive age. Human Papilloma Virus (HPV), especially the oncogenic HPV are the main culprit of this disease. Effective vaccination of HPV can prevent Carcinoma cervix and it is the preferred method for long-term reduction of Cervical neoplasia. Developed countries have established comprehensive HPV vaccination programs, but it is not established in the low-middle income countries yet. The objective of our paper is to evaluate the efficacy and cost-effectiveness of HPV vaccination for the prevention of Ca Cervix and make a comprehensive cancer control plan for Ca Cervix in a low-middle income country setting. We used narrative analysis to evaluate the cost-effectiveness of HPV vaccination for a low resource low-middle income country and propose a comprehensive cancer control plan appropriate for them. Primary prevention (HPV vaccination) along with Secondary prevention (Screening by Visual Inspection with Acetic Acid-VIA or Pap smear or HPV DNA detection) and early treatment of precancerous lesions are very much cost-effective for the prevention of Cervical cancer. Carcinoma cervix is a preventable and curable disease despite rapidly growing cancer with high mortality and morbidity. A comprehensive cancer control plan with effective screening and HPV vaccination will make a difference by reducing the national and global burden of Cervical.

Key Words: Carcinoma Cervix, Human Papilloma Virus, Vaccination and Screening

Cite Article: Baishnab, M. and Roy, T. (2021). A comprehensive Cervical Cancer Control Plan in a low-middle income country: Bangladesh perspective. Journal of Molecular Studies and Medicine Research, 06(01), 193-199. Crossref: <https://doi.org/10.18801/jmsmr.060121.23>



This article is distributed under terms of a Creative Common Attribution 4.0 International

I. Introduction

Cancer is the abnormal and uncontrolled cell division occurred in any part of our body leading to tissue dysfunction and organ damage and one of the leading causes of global mortality (WHO 2021). Cervical cancer is the malignant neoplasm of the cervix (a female reproductive organ). It is the fourth most common cancer in women of all ages and the second most common cancer in women of reproductive age (Cancer Council 2020b; MAYO Clinic 2021; WHO 2021). Most of the cancers are preventable, and some are curable if detected early. Low-middle-income countries suffer most due to cancer. Low-middle

income countries contribute about 70% of cancer-related mortality, 30% of which is due to HPV and Hepatitis infection (WHO 2021).

The incidence of cervical cancer was 604,127 in 2020 globally (Cancer Council 2020a), with 341,831 mortalities. Almost 90% of the disease burden is from low-middle income countries where screening, investigation, and treatment options are low due to limited resources (Cancer Council 2020a; Sung et al. 2021). As a low-middle income country with a high-density population and limited screening program, Bangladesh is highly prevalent for cervical cancer. Among women of reproductive age group, Ca Cervix ranks fourth globally and second in Bangladesh (WHO 2021; Sung et al. 2021) with about 12,000 new cases and 6000 deaths per year. In 2020, the age-standardized rate of cervical cancer incidence and mortality was 10.6 and 6.7 per 100,000 population, respectively (Cancer Council 2020b). The main cause of Cervical cancer is the Human Papilloma Virus (HPV) infection (Brinton et al. 1993; Cancer Council; WHO 2020b). This virus is spread mainly through sexual activities and skin-skin contact. There are several strains of HPV. HPV16 and HPV18 are the most common carcinogenic strains of HPV and are responsible for about 70% of cervical carcinoma (MAYO Clinic 2021; WHO, 2022). HPV also causes pre-cancerous lesions and cancers of the female genitalia, penis, lips, oral cavity, etc. The risk factors for HPV infection and eventually developing cervical carcinoma are early exposure to sexual activities, multiple sexual partners, multipara, a low spacing of childbirth, poor personal hygiene, history of Sexually Transmitted diseases, history of HPV infection, smoking, immunodeficiency, family history of Cervical cancer, etc. (Brinton et al. 1993; MAYO Clinic 2021; Hulka 1982; ACS 2020b).

The common sign-symptoms of cervical cancer are- vaginal bleeding, post-coital bleeding, post-menopausal bleeding, dysmenorrhea, dyspareunia, per vaginal discharge, pelvic pain, etc. (ACS 2020c). The staging of cervical cancer is determined by the FIGO (International Federation of Gynecology and Obstetrics) staging system (ACS 2020a; Waggoner 2003). Prevention of cervical cancer includes Primary prevention (HPV vaccination), Secondary prevention (Screening), Tertiary prevention (early detection and treatment), and palliative care (Aref-Adib and Freeman-Wang, 2016; Brisson and Drolet, 2019; Canfell 2019). Treatment and prognosis of cervical cancer depend on the stage of cancer, physical condition, patient comorbidities, time of detection and treatment measures. Treatment options are surgery (Simple vaginal or abdominal hysterectomy, radical hysterectomy with or without lymph node dissection), chemotherapy, radiotherapy and palliative therapy (WHO 2020b; Waggoner 2003).

Cervical cancer screening should be done in all women of the reproductive age group. There are three screening tests for cervical cancer recommended by WHO. Conventional Pap Smear for detecting abnormal cervical cells (VIA) Visual Inspection of the cervix with Acetic acid (Denny et al. 2002) and Screening of high-risk carcinogenic HPV DNA (Cancer Council 2020). The new high-risk HPV screening test is more effective than the Pap smear cytology test and has replaced the conventional Pap smear screening test in high-income countries (Cancer Council 2020; Huh et al. 2015; Schiffman et al. 2011). But it is not readily available in low-middle income countries where VIA is recommended (Brisson and Drolet, 2019; WHO 2017). As HPV infection is the major cause of cervical cancer, this malignant disease can easily be prevented if the infection is controlled.

II. Cervical cancer control frameworks in Bangladesh

As a low-middle income country with a high population density, Bangladesh has a high rate of cervical cancer (WHO 2020a). Women's sexual and reproductive health is much neglected here. Yet, the government of Bangladesh has taken several strategies to prevent and control cervical cancer in Bangladesh. Screening for Cervical cancer by VIA test is available in all government health care centers. For this purpose, training of the doctors, nurses, midwives, community health workers, etc, building infrastructures, arranging financial and logistic supports for this screening test has been taken. The introduction of HPV vaccination was done in 2016 in Gazipur with the help of GAVI (Global Alliance for Vaccines and Immunization) (Gallagher et al. 2018). Proper family planning, counseling, distributing family planning methods, encouraging people to use condoms, National tobacco control strategy is a few interventions taken by the Bangladeshi government (WHO 2017).

The main objective of a standard Cancer Control Plan is to reduce the mortality and morbidity that arose from the disease process of cancer and its consequences. The proposed Cancer Control Intervention

Plan implements a school-based HPV vaccination among females from 9-15 years of age group at the national level. HPV vaccination is most effective if given prior to the commencement of active sexual life. Usually, two doses are needed. Two doses of bivalent HPV vaccination are cost-effective to prevent Carcinoma Cervix (Mahumud et al. 2020; Brisson and Drolet, 2019).

The key issues for developing a standard cancer control plan are, A) Developing a national cancer control guideline, B) Identifying the target groups of interventions, C) Proper planning for the interventions, D) Setting specific goals and objectives, E) Addressing the barriers to achieving the goals, F) Collaboration with the stakeholders, government, non-government, and international organizations, G) Assessing the significance, effectiveness, and limitations of the interventions, and H) Planning for the strategies to implement the interventions at the field level.

III. Priority actions

For developing a comprehensive cancer control plan in low-middle income countries, availability of the resources, best use of the funds, effective cancer control strategies, and interventions should be emphasized. Policymakers should focus on the ways to overcome the potential barriers build effective communication and collaboration to implement National Cancer Control Plans (Canfell 2019; WHO 2020c). Planning and preparedness for the intervention. Proper training program for the schoolteachers, staff, health care workers for successful vaccination campaigns. Collaboration with the school authority. Arrange financial assistance. Reduce social barriers.

Some other relevant and top priority interventions for Cervical cancer control are- Health education regarding sexual and reproductive health, Increase screening coverage with VIA, Introduce the new screening intervention (detection of HPV DNA), Encouraging people to use barrier methods (condoms) during sexual activity, Provision of family planning and adequate birth spacing, Encourage male circumcision, Establish a proper referral system for early diagnosis and treatment of cervical cancer, Tobacco control interventions, etc. (Denny 2005).

Firstly, health education regarding sexual and reproductive health is an essential primary preventive intervention for cervical cancer control. Sex education should be given about the risk factors of developing cervical cancer, measures of prevention, the transmission of HPV, appropriate time of initiation of sexual activities, adverse effects of multiple sex-partners, using safe contraceptive methods (Condoms) to prevent STD, HIV, HPV, HBV and HCV. The importance of HPV vaccination before starting sexual activities and the timing of screening should also be included in the sex education program. Sex education can be included in the school academic subject adjusted to the social-cultural and religious context of Bangladesh. If we can ensure proper sex education about HPV, cervical cancer, and STDs among the school-going young adults before initiation of their sexual life, it would reduce cervical cancer prevalence in the long run. Sex education should be given to the high-risk groups of developing cervical cancer, like sex workers (Brisson and Drolet 2019).

Secondly, Screening for cervical cancer is a top priority intervention accepted worldwide (Cancer Council 2020; Huh et al. 2015). WHO recommends three screening systems for the early detection of cervical cancer. Visual inspection of the cervix with Acetic acid solution is commonly practiced in Bangladesh. Intervention focusing to extend the screening coverage can be very useful. Training of the doctors, nurses, community health workers, health assistants, paramedics about performing and interpreting VIA tests at all levels of health care systems of Bangladesh, ensuring adequate reagents for the test in all health care centers, maintaining a proper record for cervical cancer screening, establishing a standard guideline for follow-up after VIA test is necessary to make this intervention successful (WHO, 2017; 2020c).

Thirdly, new and modern cervical cancer screening tests can be introduced in Bangladesh. As detecting high-risk groups of HPV DNA has replaced the previous conventional Pap smear test in many countries due to its greater efficacy and effectiveness (Cancer Council 2020; Huh et al. 2015; Schiffman et al. 2011), it can be a better method of screening in Bangladesh too (Aref-Adib and Freeman-Wang, 2016; Cancer Council 2020).

Fourthly, a safe contraceptive method like condoms can save people (both females and males) from STDs, HPV infection, and thus it can help prevent Cervical carcinoma in females. Though, condoms are fewer effective methods for contraception compared to hormonal contraceptives. But it provides additional protection against spreading infections and is free from hormonal adverse effects on the body. Distributing free condoms among women of reproductive age among sex workers can be effective. Public health programs to encourage people to use condoms with active media participation will strengthen the implementation of this intervention. Educating people about the proper use and discard method of condoms, encouraging companies to produce condoms affordable for the general people of Bangladesh, reducing the tax on condoms, proper distribution of condoms to make them available in the remote areas of Bangladesh is necessary.

Fifthly, family planning is essential for sexual and reproductive health. At the early age of first childbirth, multiple and frequent childbirths are risk factors for cervical cancer. The fertility rate of Bangladeshi women is high. The rate of childbirth is also high in Bangladesh. Health education about family planning encouraging people about temporary or permanent methods of contraception will reduce the prevalence of cervical cancer. Proper family planning and spacing of childbirth will also help control the population boom. Women's health is often neglected in low-middle-income countries like Bangladesh. Early pregnancy, pregnancy and childbirth-related complications are important causative factors for maternal mortality neonatal, infant and under-five mortality in Bangladesh. This intervention will benefit women's and children's health, control the population, and reduce the risk of cervical cancer at the population level.

Sixthly, male circumcision is a protective measure against STV and HPV infection. It is commonly practiced among Muslims, Christians, and Jews. As most Bangladesh people are Muslims, circumcision is commonly done here. Encouraging other religious people who don't practice male circumcision can be helpful here for preventing HPV and other STDs.

Seventhly, strengthening the National Tobacco Control Strategy is one of the key interventions for cervical cancer control. Smoking is the single most common cause of lung cancer. But it is responsible for several cancers of our body, such as the larynx, oropharynx, stomach, liver, pancreas, kidney, urinary bladder, colorectal carcinoma, cervical cancer, leukemia, etc.

Finally, establishing a proper referral system for early diagnosis and treatment of cervical cancer is the prime tertiary cancer prevention intervention. A clear guideline about the referral, management, treatment, and rehabilitation, building proper infrastructure for early diagnosis and treatment of cervical cancer is desirable. But, as a low-middle income country, implementation of this tertiary cancer control intervention may be challenging to achieve. Yet, goals should be set for this and a multidisciplinary approach with the active participation of stakeholders, financial help and advocacy from the national and international health organizations, and leadership from the government is needed.

As one of the most common and dangerous malignant diseases of women, cervical cancer has become a global threat. The WHO (World Health Organization) has outlined a global strategy for the elimination of cervical cancer by 2030 (WHO 2020c). WHO declared Carcinoma cervix as a public health problem in 2018 and included this elimination strategy in their SDGs (Sustainable Development Plans) (Canfell 2019; WHO 2020c).

WHO has set a "90-70-90 target" to eliminate cervical cancer within 2030. This "90-70-90 target" is consists of three targets. They are- 90% HPV vaccination coverage, 70% cervical cancer screening coverage, and 90% treatment coverage (for both precancerous lesions and invasive cervical carcinomas) (WHO 2020c).

HPV vaccination is considered the most effective measure for preventing HPV infection (Audisio et al. 2016). Most countries have already outlined their National cervical cancer control plan in response to the WHO's "90-70-90 target" (WHO 2020c). HPV vaccination is a long-term preventive measure against cervical cancer. A school-based HPV vaccination intervention can access the majority of females from 9-15 years of age. So, the accessibility of the intervention will be great.

IV. Limitations

The proposed Cervical Cancer Control Plan has some limitations and barriers. Firstly, providing HPV vaccination is *an expensive intervention and very challenging* for low-middle income countries like Bangladesh (Denny 2005). HPV vaccination needs two doses which cost around 100 USD per dose (Gallagher et al. 2018; Mahumud 2019). In a highly populated country, it needs more financial ability to implement this intervention. Financial help from international organizations like WHO, GAVI (Global Alliance for Vaccines and Immunization) (Mahumud 2019), IARC (International Agency for Research on Cancer) is needed for this purpose.

Secondly, for getting the maximum effect of immunization, maintenance of *cold chain* is mandatory from produced to distributor up to consumer level. As Bangladesh is a hot and humid country and country with low resources, low infra-structures; strict maintenance of the cold chain for the vaccination can be difficult, resulting in reduced effectiveness of the vaccines. Supply and distribution of the vaccines are also costly (Gallagher et al. 2018). It needs more logistic support as well.

Thirdly, to implement this Cancer Control Plan, we have to think about the *social acceptability and stigmata* of this region. Women's health is often neglected in this region. The majority of women and girls are not aware of their health. Awareness about cervical cancer is very poor among them (Islam et al. 2018). There are certain social factors, superstitions, anti-vaccination campaigns that may adversely affect the Cervical Cancer Control Plan. We have to address the problems comprehensively by the social, cultural, religious, and economic factors of Bangladesh.

Fourthly, if we choose a school-based vaccination program, many girls would remain out of the vaccination schedule who don't go to school or have been dropped out of school. Training of the teachers and school staff, collaboration with the school authorities, managing local leaders, political and administrative bodies are necessary to overcome this barrier which can be time-consuming (WHO 2017).

Finally, the government of Bangladesh is running a series of vaccination programs for the top priority childhood diseases as recommended by WHO. HPV vaccination has been introduced to Bangladesh, but it has not started nationally. Concomitant maintenance of several established and several new vaccination programs nationally can be very challenging for this country with its low resources and weak infrastructures (Gallagher et al. 2018; Sutcliffe 2010).

V. Conclusion

A healthy mother is a gateway to building a healthy nation. Women's reproductive health is often neglected in low-middle-income countries. WHO declared Cervical cancer as a public health problem and announced a call for action for the elimination of Cervical cancer globally (WHO 2020c; Canfell 2019). HPV vaccination and cervical cancer screening have been proven cost-effective strategies for eliminating cervical cancer (Simms et al. 2019). Women of low-middle income countries are more vulnerable to developing Cervical cancer, but HPV vaccination is not established nationally in several Low-middle income countries like Bangladesh (WHO 2017). HPV vaccination provides long-term immunity against HPV infection and reduces the risk of cervical cancer, genital warts, and precancerous lesions.

A school-based HPV vaccination intervention as a cervical cancer control plan effectively reduces the incidence, mortality, and morbidity of cervical cancer and its consequences. It will make the vaccination program available and accessible to the majority of the eligible girls of Bangladesh. Though we should always keep in mind the financial condition and the low resources of the region, this intervention can be implemented successfully with the leadership of the government of Bangladesh and the help of international organizations.

V. References

- [1]. Aref-Adib, M. and Freeman-Wang, T. (2016). Cervical cancer prevention and screening: the role of human papillomavirus testing. *The Obstetrician & Gynaecologist*, 18(4), 251-263. DOI: <https://doi.org/10.1111/tog.12279>.
- [2]. Audisio, R. A. Icardi, G. Isidori, A. M. Liverani, C. A. Lombardi, A. Mariani, L. and Zuccotti, G. V. (2016). Public health value of universal HPV vaccination. *Critical Reviews in Oncology/Hematology*, 97, 157-167. DOI: <https://doi.org/10.1016/j.critrevonc.2015.07.015>.
- [3]. Brinton, L. A. Herrero, R. Reeves, W. C. de Britton, R. C. Gaitan, E. and Tenorio, F. (1993). Risk factors for cervical cancer by histology. *Gynecologic oncology*, 51(3), 301-306.
- [4]. Brisson, M. and Drolet, M. (2019). Global elimination of cervical cancer as a public health problem. *The Lancet Oncology*, 20(3), 319-321.
- [5]. Cancer, I. A. f. R. o. (2020a). *Cervix uteri fact sheet, Globocan 2020*. Retrieved from <https://gco.iarc.fr/today/data/factsheets/cancers/23-Cervix-uteri-fact-sheet.pdf>.
- [6]. Cancer, I. A. f. R. o. (2020b). GLOBOCAN 2020: New Global Cancer Data. Retrieved from <https://www.uicc.org/news/globocan-2020-new-global-cancer-data>.
- [7]. Canfell, K. (2019). Towards the global elimination of cervical cancer. *Papillomavirus research*, 8, 100170.
- [8]. MAYO Clinic (2021). Cervical Cancer. Retrieved from <https://www.mayoclinic.org/diseases-conditions/cervical-cancer/symptoms-causes/syc-20352501>.
- [9]. Cancer Council (2020). Cervical Screening. Retrieved from https://www.cancer.org.au/cervicalscreening/?gclid=CjwKCAiA17P9BRB2EiwAMvwNyBrqwY8fYQx1pGynOYbOfcE_0IVPlsWA3EoCNoYcB6qdGUud9nHiqxoCTMkQAvD_BwE.
- [10]. Cancer Council (2020b). Cervical cancer. Retrieved from <https://www.cancer.org.au/cancer-information/types-of-cancer/cervical-cancer>.
- [11]. Denny, L. (2005). The prevention of cervical cancer in developing countries. *BJOG: An International Journal of Obstetrics & Gynaecology*, 112(9), 1204-1212.
- [12]. Denny, L. Kuhn, L. Pollack, A. and Wright Jr, T. C. (2002). Direct visual inspection for cervical cancer screening: an analysis of factors influencing test performance. *Cancer*, 94(6), 1699-1707.
- [13]. Gallagher, K. E. LaMontagne, D. S. and Watson-Jones, D. (2018). Status of HPV vaccine introduction and barriers to country uptake. *Vaccine*, 36(32), 4761-4767.
- [14]. Huh, W. K. Ault, K. A. Chelmow, D. Davey, D. D. Goulart, R. A. Garcia, F. A. and Saslow, D. (2015). Use of primary high-risk human papillomavirus testing for cervical cancer screening: interim clinical guidance. *Obstet Gynecol*, 25(2), 330-337.
- [15]. Hulka, B. S. (1982). Risk factors for cervical cancer. *Journal of Chronic Diseases*, 35(1), 3-11.
- [16]. Islam, J. Y. Khatun, F. Alam, A. Sultana, F. Bhuiyan, A. Alam, N. and Nahar, Q. (2018). Knowledge of cervical cancer and HPV vaccine in Bangladeshi women: a population based, cross-sectional study. *BMC women's health*, 18(1), 1-13.
- [17]. Mahumud, R. (2019). Bivalent HPV vaccine cost effective at Gavi prices in Bangladesh. *Pharmaco Economics & Outcomes News*, 841, 4-16.
- [18]. Mahumud, R. A. Gow, J. Alam, K. Keramat, S. A. Hossain, M. G. Sultana, M. and Islam, S. M. S. (2020). Cost-effectiveness of the introduction of two-dose bi-valent (Cervarix) and quadrivalent (Gardasil) HPV vaccination for adolescent girls in Bangladesh. *Vaccine*, 38(2), 165-172. DOI: <https://doi.org/10.1016/j.vaccine.2019.10.037>
- [19]. WHO (World Health Organization) (2017). National Strategy for Cervical Cancer Prevention and Control in Bangladesh, 2017-2022. Retrieved from <https://www.who.int/bangladesh/news/detail/24-09-2017-national-strategy-for-cervical-cancer-prevention-and-control-in-bangladesh-2017-2022>
- [20]. WHO (World Health Organization) (2020a). Bangladesh Cancer Country Profile 2020. Retrieved from https://www.who.int/cancer/country-profiles/BGD_2020.pdf
- [21]. WHO (World Health Organization) (2020b). Cervical Cancer. Retrieved from https://www.who.int/health-topics/cervical-cancer#tab=tab_1.
- [22]. WHO (World Health Organization) (2020c). Cervical Cancer Elimination Initiative. Retrieved from <https://www.who.int/initiatives/cervical-cancer-elimination-initiative>.
- [23]. WHO (World Health Organization) (2021). Cancer Fact Sheets. Retrieved from <https://www.who.int/news-room/fact->

sheets/detail/cancer#:~:text=Globally%2C%20about%201%20in%206,%2D%20and%20middle%2Dincome%20countries.

- [24]. Prevention, C. f. D. C. a. (2021). HPV Vaccine Safety and Effectiveness Data. Retrieved from <https://www.cdc.gov/hpv/hcp/vaccine-safety-data.html>.
- [25]. Schiffman, M. Wentzensen, N. Wacholder, S. Kinney, W. Gage, J. C. and Castle, P. E. (2011). Human papillomavirus testing in the prevention of cervical cancer. *Journal of the National cancer institute*, 103(5), 368-383.
- [26]. Simms, K. T. Steinberg, J. Caruana, M. Smith, M. A. Lew, J.-B. Soerjomataram, I. and Canfell, K. (2019). Impact of scaled up human papillomavirus vaccination and cervical screening and the potential for global elimination of cervical cancer in 181 countries, 2020–99: a modelling study. *The Lancet Oncology*, 20(3), 394-407. [https://doi.org/10.1016/S1470-2045\(18\)30836-2](https://doi.org/10.1016/S1470-2045(18)30836-2).
- [27]. ACS (American Cancer Society) (2019). What is Cervical Cancer. Retrieved from <https://www.cancer.org/cancer/cervical-cancer/about/what-is-cervical-cancer.html>.
- [28]. ACS (American Cancer Society) (2020a). Early Detection, Diagnosis, and Staging.
- [29]. ACS (American Cancer Society) (2020b). Risk factors of cervical cancer. Retrieved from <https://www.cancer.org/cancer/cervical-cancer/causes-risks-prevention/risk-factors.html>.
- [30]. ACS (American Cancer Society) (2020c). Signs and Symptoms of Cervical Cancer. Retrieved from <https://www.cancer.org/cancer/cervical-cancer/detection-diagnosis-staging/signs-symptoms.html>.
- [31]. Sung, H. Ferlay, J. Siegel, R. L. Laversanne, M. Soerjomataram, I. Jemal, A. and Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: a cancer journal for clinicians*, 71(3), 209-249.
- [32]. Sutcliffe, S. (2010). From cancer care to cancer control: organization of population-based cancer control systems. *Cancer Control*, 279.
- [33]. Taira, A. V. Neukermans, C. P. and Sanders, G. D. (2004). Evaluating human papillomavirus vaccination programs. *Emerging infectious diseases*, 10(11), 1915-1923.
- [34]. Waggoner, S. E. (2003). Cervical cancer. *The Lancet*, 361(9376), 2217-2225.

HOW TO CITE THIS ARTICLE?

MLA

Baishnab, M. and Roy, T. "A comprehensive Cervical Cancer Control Plan in a low-middle income country: Bangladesh perspective". *Journal of Molecular Studies and Medicine Research*, 06(01), (2021): 193-199.

APA

Baishnab, M. and Roy, T. (2021). A comprehensive Cervical Cancer Control Plan in a low-middle income country: Bangladesh perspective. *Journal of Molecular Studies and Medicine Research*, 06(01), 193-199.

Chicago

Baishnab, M. and Roy, T. "A comprehensive Cervical Cancer Control Plan in a low-middle income country: Bangladesh perspective". *Journal of Molecular Studies and Medicine Research*, 06(01), (2021): 193-199.

Harvard

Baishnab, M. and Roy, T. 2021. A comprehensive Cervical Cancer Control Plan in a low-middle income country: Bangladesh perspective. *Journal of Molecular Studies and Medicine Research*, 06(01), pp. 193-199.

Vancouver

Baishnab, M and Roy, T. A comprehensive Cervical Cancer Control Plan in a low-middle income country: Bangladesh perspective. *Journal of Bioscience and Agriculture Research*, 2021 December, 06(01): 193-199.