

Future Potential and Challenges in India's Health System, With a Focus on Cancer Care

Ms. Saima Pervez

Research Scholar, Amity School of Communication, Amity University, Noida, E-mail:
saima_pervez_12@yahoo.co.in

Dr. Piyashi Dutta

Assistant Professor, Amity School of Communication, Amity University, Noida, E-mail:
piyashi.dutta@gmail.com

ABSTRACT

People are going to get cancer at an alarming rate all over the world because of the 351-page World Cancer Analysis, which was made by the International Agency for Research on Cancer (IARC) (Stewart and Kleiues 2003). There will be 15 million new cases of cancer in India by 2020, which will put a strain on the country's health care system (Hyuna Sung). This is because the population is getting older in both developed and emerging nations, as well as because of recent trends in cigarettes and unhealthy living, which will lead to more people getting sick. Cancer has become a major public health problem in countries like India, which shows how important it is in richer countries. Healthy lifestyles and public health efforts by governments and health care providers could stop this trend as well as help stop up to one-third of all malignancies around the world. As a result, the goal of this scopus article is to look at the future opportunities and challenges in India's health system, with a focus on cancer. As a result, in India, the pattern of rising cancer rates has changed over time, with an alarming increase in cases such as poor performance status and probably a more aggressive phenotype. Many other regional cancer centres and hospitals in smaller cities are also found to be trailing behind.

Keywords: - India, cancer, potential, challenges, health system

Introduction

People in India make up 1.22 billion people, which make it the second-most-populous country in the world. China has more people than India. Most Indians will always get cancer in the next 20 years. The incidence rate will rise to about 1.7 million a year, and that's how many people will get it. Economic and social problems mean that most cancer sufferers in India have already had a lot of damage done when they come in for therapies. This adds another level of complexity to the country's oncology community (Ronald Piana, 2012). When Rakesh Chopra, MD, a clinical oncologist at Apollo Cancer Centre in New Delhi, spoke with ASCO (American Society of Clinical Oncology), he found that because of data restrictions, they couldn't figure out how many people in India have cancer and what kinds of cancer there are. In addition, because India has a huge population and a large area, there aren't many specialists to help people in rural areas get treatment.

For example, in rural areas, Ronaldo thinks there will be more cheap treatments for people who need help and supplements for people who need help. They should also be easier to get. To make rules that are based on India's population, we need to pay attention to the country's

different groups of people and how they live together. There are now more lung cancers in men than prostate cancers. It was once ranked fifth. It used to be the most prevalent type of cancer in women who lived in cities a few years ago. Now, it isn't as common and breast cancer has already taken it. Also the most prevalent type of cancer in remote regions, cervical cancer is by far the most common type of cancer there (The Hindu 2004). It has become a big problem for individuals all over the globe, especially in poorer countries, because of changes in how people live, healthier survive, and better treatment for communicable diseases. Cancer has overtaken heart problems as India's top cause of both morbidity and death. India's ICMR National Centre for Disease Informatics and Research says that in 2016, 1.45 million people were diagnosed with cancer. People will have to pay more for health care in the next 20 years. When Ferrlay J and Soerjomataram I wrote this in 2015, they said that it was true. People at the ICMR started a programme called the National Cancer Registry Program in December of 1981. This programme kept track of people with cancer. If you want to find out about cancer rates and trends in the United States, this is your best source. It's now possible to find 29 population-based cancer registries (PBCRs) and 29 hospital-based cancer registries that keep track of people who have cancer. There are about 10% of the people in India who are like this one group of people. Eleven of these PBCRs are found in the North-East (NE). It's more common for men in the West to get cancer than in India. In Brazil, there were 631.9 cases per 100,000 people, and there were 493.9 in the United States. If you live in Aizawl district, you'll get a score of 270.0, while Delhi gets a score of 149. In Brazil, there are 474.6 women for every 100,000 people. In the United States, there are 363.3 women for every 100,000 people. In Aizawl, there are 207.7 women for every 100,000 people (India). People who are men get lung cancer, head and neck cancer (mouth, tongue, and throat), prostate cancer, and oesophageal cancer. People who are women are more likely than men to get cancer of the breasts, oral cavity, cervix, ovary, and uterus (Dikshit R, 2012).

When you look at the PBCRs from Delhi to Chennai to Bengaluru to Bhopal to Mumbai, the numbers of cervical cancers have gone down a lot over the last 30 years or so. In these records, colon/rectum, lung, breast, and prostate cancers are becoming more common (Dikshit R, 2012). When McDermott et al. looked at 16 states or territories; they found 138 groups that provided hospice and palliative care. Except in Kerala, where more services are offered, these services are generally found in large cities and regional medical clinics. When McDermott came out in 2008, he said that. A network called Kerala has more than 60 units and serves more than 12 million people. It's one of the world's largest (SK Kumar, 2007). In India, the rate of cancer varies a lot depending on where you live. A lot of people get cancer in India, and it's most common among men and women in the NE area. Male cases were found in Aizawl district in Mizoram, while female cases were found in Papum Pare district in Arunachal Pradesh. Gallbladder cancer affects a large number of persons in India's north and northeast. People in Chennai and Bengaluru PBCRs are more likely to develop stomach cancer than people in other parts of the country. This demonstrates that gallbladder cancer can be caused by a variety of variables, including environmental, dietary, lifestyle, and hereditary factors.

Tobacco use in various forms is connected to approximately 50% of cancers in males and 15% of cancers in women. Some of these are cancers of the airway (head and neck, lung, and oesophagus), the renal and urinary bladder, the pancreas, and other regions of the body. It is clear that cutting back on smoking cigarettes is the best way to cut down on the number of people who get these diseases. Cancer research programmes that study the biology of people with PBCRs in different states will help us find risk factors and find ways to prevent them. At the time of diagnosis, more than 75% to 80% of people have already been sick for a long time (Stage 3-4) Mallath MK, 2014: People don't know about cancer, and community doctors don't know about it, either. There aren't any screening programmes, and there are long distances to travel to a big cancer centre, as well as financial and shame issues. A tertiary care oncology centre is far away for people who live in rural areas. They have to travel a long way to get there (which account for 69 percent of the total population). Time, money, language and cultural differences are some of the things that make it hard for people to get to where they want to go.

Future potential in India's health system, with a focus on cancer care

Screening for oral cancer can be done with simple new methods like looking at the mouth and applying acetic acid to it. These methods are called "simple innovative methods." (Sankaranarayanan R and Esmy PO, 2007) found that these two common cancers can be screened for with inexpensive and effective methods. Likewise, in the context of cancer, self-examination or a doctor's inspection may be preferable than screening mammography for early detection, as early identification allows for medical therapy with little or no side effects. Finally, screening programmes may help to reduce the incidence of some of India's most frequent cancers, such as lung cancer and breast cancer. The Government of India (GOI) has attempted to establish regional cancer centres in rural areas as well as to upgrade medical schools with oncology sections. The Indian government has allocated each state 120 million rupees to create 20 state-level cancer centres to aid in the fight against cancer, diabetes, heart disease, and stroke. The Indian government has also set aside \$20 million to assist in the construction of 23 new tertiary care centres and the improvement of 27 regional cancer centres. PMSSY is a government programme that helps people stay healthy and safe. There will be eight new cancer centres built around the country as part of the Pradhan Mantri Swasthya Yojna, and 58 existing medical schools will be updated in stages. This is a huge project that will take years to turn into normal care and survival benefits. In rural areas, setting up and strengthening basic health care services could be one way to deal with this problem. People should also be told about cancer and other diseases that are caused by pollution, as well as how to stay healthy by eating well and not smoking. There were two people who wrote this: (Grover S and Gudi S in 2017).

When cancer is diagnosed early, the chances of a full recovery are much better. This is why experts in health care, researchers, and doctors should focus on getting the disease diagnosed as soon as possible. Several non-profit organisations provide home care to raise public awareness, assist with screening and early detection, patient and family support, and care for the terminally ill. It was written in 2009 by Swaminathan R and Selvakumaran R, and it states

that they must maintain and strengthen their participation in the cancer registry control plan. It has also taken the time to compile consensus agreements on the most common malignancies in India in order to improve and standardise cancer therapy. It is these evidence-based guidelines that have been devised by specialists to ensure that cancer treatment in India's cancer centres is consistently and effectively delivered. Recent attempts to address these issues have included the establishment of the National Health Mission and insurance programmes such as the Rashtriya Swasthya Bima Yojna, Rajiv Aarogyasri System, Vajpayee Arogyashree Scheme, and Gujarat health scheme model, which are all administered by various state governments (ICMR- National Institute of Cancer Prevention and Research, 2018). The most important thing right now is to educate people about these programmes in order to prepare them for the future. India is home to a large number of people who are genetically diverse. In India, there are 4000 ethnolinguistic groups and 22 different languages (Sundar S, Khetrapal-Singh P, 2018). Smoking, drinking alcohol, and taking herbal medicines can all affect how drugs are broken down in the body. This opens the door to research into how the environment affects drug metabolism, how drug targets change, and how drug-related genetic polymorphism affects how drugs work. In terms of genetics, culture, languages, and how they eat, the Indian people are very different from other people. In addition, a well-designed genome-wide association study can help find the cause of an illness and the drugs that might help. In the age of precision medicine, it will be important to figure out which populations or groups of people are at risk for the high rate of cancer in these areas, as well as whether these groups need to be given different doses or be more careful during treatment. These are the examples of translational studies that can be done in a few centres and then looked at for use in other centres. Imaging, bioinformatics, gene expression profiling, pathology, sequencing, and the identification of circulating tumour cells are all examples. It was written by Saini KS and Agarwal G in 2013.

Future health-care concerns and challenges in India, with a focus on cancer care

It is because of healthcare professionals' preference for working in metropolitan areas that the distribution of healthcare centres and practitioners has become imbalanced. Medical oncologists, radiation oncologists, and surgical oncologists, as well as specialists in pain and palliative care as well as ancillary services including diagnostics and pathology investigations are all available at many tertiary care centres (but not all). Lack of doctors, health workers, technical staff, and pathologists to analyse pathological material has been one of the main reasons why India hasn't been able to run screening programmes. This has caused a lot of problems in India's health care system, especially when it comes to cancer care.

It has yet to be realised in rural India (Banavali SD, 2015) that such a complicated team is necessary. There has been a lot of progress in this field in the last few years, but there is still a lot of work to be done to set up a proper medical research environment. People, who work in the health care field, as well as medical students and teachers at medical schools, need to be taught how to turn clinical research into real-world solutions. There has been a lot of progress in the Indian health sector recently, but it still needs to spend more money on new molecule research and medical treatment that is focused on India. This is what Agarwal G, Saini KS,

Saini KS, 2013 says. To agree on the most important cancer research goals in the Indian context, predicated on the most prevalent cancer in men and women in a certain place, would be one of the most important things. In some parts of the country, a few types of cancers are more common than others, like gallbladder cancer in the Gangetic belt, penile cancer in remote regions, oesophageal cancer in the north, colon cancer in Goa, and stomach cancer in the southern and north-eastern parts of the country, where they are more common. These tumours aren't very common in the Western world, so they don't get a lot of attention from scientists. It is unknown whether these geographical disparities in cancer epidemiology are due to genetic and biological differences, changes in the prevalence of cancer risk factors, or a mix of the two. This would be an important subject for research to look into. People who are overweight or who live an unhealthy lifestyle may benefit from research that focuses on these kinds of problems, as well. In light of the fact that most patients had advanced disease and were in poor health when they came in, efforts to come up with cost-effective palliative care recommendations would be good; Dabkara D, Ganguly S, 2018. A few simple, but important, steps include setting guidelines for less dangerous regimens (like metronomic therapy that doesn't require many visits to a busy cancer hospital) and cutting down on the need for imaging (e.g. computed tomography scan) (Eissa HM, Allen CE, 2014). Investigators, industry, funding agencies, and regulatory bodies all need to work together to understand each other's needs and desires. It would be easier to find themes that could improve palliative care delivery in India if groups and networks were set up to use study and research methods. It would also be easier to find areas where there isn't enough evidence to support best practises (BK Mohanti, 2011).

If you live in a country that has a bad economy, you can't do as much cancer research as you need to. We have a lot of people who haven't had any treatment and are young enough to be good candidates for clinical trials in this setting. This makes clinical trials a very good option. There must also be more small, multidisciplinary, well-equipped cancer clinics in smaller townships as well as rural areas, where the majority of people is still not getting the care they need from the health care system. More should be done to teach people in the community about the dangers of cancer and how important it is to get a cancer screening services and other precautionary treatments (Ronald Paina, 2012).

India's health system with special reference to cancer care

There is a silent cancer treatment problem in underdeveloped countries like India that is getting worse every year. Despite having 85 percent of the world's population, poor countries only have around a third of the world's radiation facilities. Radiotherapy has been shown to treat at least 50% to 60% of cancer patients in developing countries, but most developing countries, such as India, lack sufficient radiotherapy devices as well as competent doctors and other health workers. Creating hospital networks and making referral systems more efficient have been recently talked about as ways to improve diagnosis and treatment in the United States (Chaturvedi et al 2002). While the fact that specialised cancer centres enhance clinical outcomes is unsurprising, establishing such in countries like India can be challenging due to a lack of funds, resources, and poor planning and management. In all of India's provinces, there

is still no government tertiary care cancer centre. The problem with health care in India and many other countries that don't have a lot of money is not that there isn't enough proof that things work. Execution is the main problem or roadblock in India's health care system, especially when it comes to cancer care. Because most cancer patients in India have late-stage, untreatable disease and many don't get treatment in a hospital, this is another reason why many don't get treatment there (Pal 2002). Government hospitals in India have inadequate medical facilities, as well as a dearth of doctors and drugs. Cancer patients in rural areas are particularly heavily struck, as they must rely on rural private practitioners (RPPs) and alternative medicine doctors. According to a number of studies, even the poorest sections of Indian society show a great aversion to using free government health care (Mather and Ramaiah 2002).

Secondary and tertiary curative care currently consumes more than half of India's health expenditure. Investing in preventative measures, on the other hand, may yield better health outcomes (Mather and Ramaiah 2002). New regulations are being implemented for tobacco, which affects an average 5 million people worldwide each year. The government wishes to prohibit advertising and impose sales restrictions. The Cigarettes and Other Tobacco Products Act, which took effect on May 1, has gained significance because the World Health Organization has determined that tobacco is more deadly in impoverished nations, where 60% of the globe's 5700 billion cigarettes are consumed each year (Roy 2004). People who smoke are thought to kill 2.8 million Indians a year. The restriction of gutka and pan masala manufacture, sale, and use in various Indian states is a major step forward in the fight against tobacco-related oral and oropharyngeal cancer (Pai 2002). To maintain the campaign against tobacco use in all forms in India, public welfare organisations and the media must collaborate. Governments are untrustworthy because, on the one hand, they restrict tobacco use while encouraging tobacco cultivation on the other. It is critical to launch a comprehensive anti-tobacco campaign that includes education and awareness programmes, as well as early detection and screening. A few dedicated institutes, such as the Chennai Cancer Institute etc., have been working toward this goal and serving as role models for others (2004, Sharma).

Advancements in India's health-care system, with a focus on cancer treatment

In the last 50 years, there have been a lot of changes in the way people think about cancer prevention, early detection, and treatment. But at the other hand, poor people's treatment is becoming more difficult. The majority of cancer patients in India are uninsured. A single hospitalisation might deplete a poor family's financial resources, creating a financial catastrophe. Private for-profit insurers, which were recently legalized in India, concentrate to the wealthy with extravagant packages but provide little assistance to the poor (Ranson 2001). More emphasis should be made on creative indigenous healthcare insurance that contribute to the financing and delivery of health care. India's administrations are incapable of dealing with the severity of the problem. Protection, as a result, must take primacy. The incidence of cervical cancer has considerably decreased in China as a result of a screening test (Li et al 2000). Cancer will continue to spread if it is not treated. While the rate of growth may vary, many epithelial cancers grow rapidly (Ash 2000).

According to O' Rourke and Edwards (2000), 21% of patients with potentially treatable lung cancer became deadly over the course of treatment. In India, patients must wait longer to receive aggressive cancer treatment. This could be for a variety of reasons, including confirmation of diagnosis, financial arrangements, obtaining expert opinion, or receiving a surgery date. In these instances, telemedicine services can be incredibly valuable. Kerala's only referral cancer hospital, the Regional Cancer Centre (RCC) in Thiruvananthapuram, has developed a web-based telemedicine system that connects the state's numerous cancer facilities. Patients can seek medical advice from professionals at their local tele-clinic and then proceed to RCC for specialised consultation and follow-up. Creating telemedicine services in remote communities is significantly less expensive than developing a super-specialized hospital in a metropolitan city (Pal et al 2002). Over half a million people who get cancer in India die within 12 years of getting the disease, and another million cancer survivors get degenerative disease within 5 years of getting the disease. Existing facilities can provide palliative care to less than 0.1 million of the 1.5 million persons who require it (PC).

The National Cancer Control Program, which dates all the way back to the 1980s, states that "cancer patients in advanced stages require effective palliative care." Despite this, there have been no established clinics (Mohanti 2002). One plan was to extend the 150 existing radiation centres to include 'doctor-nurse teams.' Outpatient palliative care facilities will be a cost-effective technique in India. After then, medical groups and non-governmental organisations (NGOs) may expand the program to also include 'homecare' within a particular community, with a particular emphasis on cancer care. The cornerstone of great cancer care remains pain management. Despite the increased availability of morphine, we have failed to create a supportive environment. Palliative treatment for Indian cancer patients will continue to be inadequate unless we can eliminate geographic and economic disparities and make oral morphine available throughout the country. While evidence-based treatment cannot be substituted for in India, the problem is to deliver therapy to the majority of impoverished people with cancer who cannot access evidence-based combination methods. Furthermore, many older cancer sufferers are unable to get conventional cancer treatment due to their decreased functional capacity (Turner et al 1999). Complementary and alternative medicine (CAM) may be quite effective in reducing these patients' symptoms in some circumstances. A sizable proportion of cancer patients in India seek treatment and palliation through complementary and alternative medicine (CAM) (Shukla and Pal 2004; Pal and Mittal 2003). Cancer is diagnosed more than twice as frequently in advanced nations as it is in poor countries. Nevertheless, although 50% of people with cancer in developed countries die as a result of the disease, 80% of cancer victims in poor countries are identified with lethal late-stage tumours, highlighting the crucial need for much improved screening systems. Every year, around 470,000 women worldwide are diagnosed with cervical cancer, with the majority of instances happening in impoverished areas. Despite the fact that this disease is highly preventable, the vast majority of women in underdeveloped countries today have little choice. If detected early enough, precancerous lesions can be treated successfully.

To help people in poor countries get screened for cervical cancer and prevent it, START (Screening Technologies to Advance Rapid Testing) is working on this project. The project will be done in two parts: Products will be researched and developed in Phase 1, and tests will be done in countries to make sure they work. The START initiative will receive \$4.8 million in funding from two private sector partners, as well as from field-based collaborators in India and China, who will all contribute to the project's success. In hopes of improving cancer care in India, a significant amount of compelling health education that focuses on quitting or reducing one's smoking is required. People of all ages should be taught how to change their habits so that they don't get cancer. The public needs to know about nutrition educations and how to clean your personal and genital areas, as well. Preventative vaccinations against the Human Papilloma Virus (HPV) and the Hepatitis B Virus (HBV) are extremely effective methods of preventing cervical cancer and maintaining liver cancer under control, respectively (Murthy and Mathew 2004). A multidisciplinary approach to cancer treatment is required, with oncologists and other specialists playing a significant role. There should be a team that includes people who teach people about how to get good health care, people who work for private health care institutions, people who write about health issues in the media, and people who get health insurance. If you want to keep people from getting cancer, you need to work on these things: tobacco control, infection control, healthy food, a cure, and palliative care all in one package.

Conclusion

Cancer is becoming a more prevalent cause of illness and death in India, particularly among the elderly. Young age (typically a decade younger than the normal population), advanced illness, poor performance status, and maybe a more aggressive phenotype are all traits that distinguish this demographic from the overall population. A significant number of regional cancer health centres in smaller towns have fallen behind in terms of cancer screening and treatment technologies. Focusing on epidemiological studies, cancer screening, and treatment trials with India-centric common malignancies could lead to better outcomes. The key to success is likely to be a planned and collaborative approach at the institutional level, as well as engagement with various research teams.

REFERENCES

1. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al., (2015), Cancer incidence and mortality worldwide: Sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer*;136: E359–86.
2. National Centre for Disease Informatics and Research, (2012-14), National Cancer Registry Programme, Indian Council of Medical Research: three Year Report of Population Based and Hospital Cancer Registries; [accessed on September 12, 2018]. Available from: <http://www.ncdindia.org>
3. Dikshit R, Gupta PC, Ramasundara C, Gajalakshmi V, Aleksandrowicz L, Badwe R, et al., (2012), Cancer mortality in India: a nationally representative survey. *Lancet*. 2012;379:1807–16.

4. Sullivan R, Badwe RA, Rath GK, Pramesh CS, Shanta V, Digumarti R, et al, (2014), Cancer research in India: National priorities, global results. *Lancet Oncol.* ;15: e 213–22.
5. Mallath MK, Taylor DG, Badwe RA, Rath GK, Shanta V, Pramesh CS, et al, (2014), The growing burden of cancer in India: Epidemiology and social context. *Lancet Oncol.* ;15: e205–12.
6. Banavali SD, (2015), Delivery of cancer care in rural India: Experiences of establishing a rural comprehensive cancer care facility. *Indian J Med Paediatr Oncol* ;36:128–31.
7. Sankaranarayanan R, Ramadas K, Thomas G, Muwonge R, Thara S, Mathew B, et al., (2005), Effect of screening on oral cancer mortality in Kerala, India: A cluster-randomised controlled trial. *Lancet* ;365:1927–33.
8. Sankaranarayanan R, Esmy PO, Rajkumar R, Muwonge R, Swaminathan R, Shanthakumari S, et al, (2007), Effect of visual screening on cervical cancer incidence and mortality in Tamil Nadu, India: A cluster-randomised trial. *Lancet* ;370:398–406.
9. Sankaranarayanan R, Ramadas K, Thara S, Muwonge R, Prabhakar J, Augustine P, et al, (2011), Clinical breast examination: Preliminary results from a cluster randomized controlled trial in India. *J Natl Cancer Inst*, 103:1476–80.
10. Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) New Delhi: MoHFW,(2018), Government of India; [accessed on September 12, 2018]. Ministry of Health and Family Welfare. Available from: <http://pmssy-mohfw.nic.in/listofcolleges.aspx> .
11. Grover S, Gudi S, Gandhi AK, Puri PM, Olson AC, Rodin D, et al., (2017), Radiation oncology in India: Challenges and opportunities. *Semin Radiat Oncol.*;27:158–63.
12. Swaminathan R, Selvakumaran R, Vinodha J, Ferlay J, Sauvaget C, Esmy PO, et al, (2009), Education and cancer incidence in a rural population in South India. *Cancer Epidemiol*, ;33:89–93.
13. ICMR- National Institute of Cancer Prevention and Research, (2018), ICMR consensus documents for cancer management. [accessed on September 9, 2018]. Available from: <http://www.cancerindia.org.in/icmr-consensusdocuments-for-cancer->
14. Sundar S, Khetrapal-Singh P, Frampton J, Trimble E, Rajaraman P, Mehrotra R, et al, (2018), Harnessing genomics to improve outcomes for women with cancer in India: Key priorities for research. *Lancet Oncol*;19: e102–12.
15. Saini KS, Agarwal G, Jagannathan R, Metzger-Filho O, Saini ML, Mistry K, et al, (2013), Challenges in launching multinational oncology clinical trials in India. *South Asian J Cancer*.;2:44–9.
16. Singh J, Thota N, Singh S, Padhi S, Mohan P, Deshwal S, et al, (2018), Screening of over 1000 Indian patients with breast and/or ovarian cancer with a multi-gene panel: Prevalence of BRCA1/2 and non-BRCA mutations. *Breast Cancer Res Treat.*;170:189–96.
17. Dabkara D, Ganguly S, Biswas B, Ghosh J, (2018), Metronomic therapy in metastatic castrate-resistant prostate cancer: Experience from a tertiary cancer care center. *Indian J Cancer.* ;55:94–7.
18. Eissa HM, Allen CE, Kamdar K, Simko S, Goradia P, Dreyer Z, et al, (2014), Pediatric Burkitt's lymphoma and diffuse B-cell lymphoma: Are surveillance scans required? *Pediatr Hematol Oncol.*;31:253–7.
19. Anon (2004). Battle against cancer. *The Hindu*, February, 06.
20. Ash DV (2000). Waiting times of cancer treatment. *Clin Oncol (RColl Radiol)*, 12, 140.
21. Chaturvedi P, Chaturvedi U (2002). Changes needed for improved cancer care in the developed world. *Lancet Oncol*, 3, 526- 27.

22. Li H, Jin S, Xu H, Thomas D B (2000). The decline in the mortality rates of cervical cancer and a plausible explanation in Shandong China. *Int J Epidemiol*, 29, 398-404.
23. Mather I, Ramaiah S (2002). Private health care in developing countries. *BMJ*, 324, 46-7.
24. Mohanti BK (2002). Palliative care for cancer patients in India: are we doing enough? *JAMA-India*, 1, 62-3.
25. Murthy N S, Mathew A (2004). Cancer epidemiology, prevention and control. *Curr Sci*, 86, 518-26.
26. O'Rourke N, Edwards R (2000). Lung cancer treatment waitingtimes and tumor growth. *Clin Oncol (R Coll Radiol)*, 12, 141-44.
27. Pai SA (2002). Gutkha banned in Indian states. *Lancet Oncol*, 3,521.
28. Pal SK, Mittal B (2003). Importance of complementary and alternative cancer therapies in palliative oncology in India. *J Alter Compl Med*, 9, 811-2.
29. Pal SK, Pandey GS, Kesari A et al (2002). Telemedicine: E-health and hospital of the future. *J Scientific Industrial Res*, 61, 414-22.
30. Pal SK (2002). Use of alternative cancer medicines in India. *Lancet Oncol*, 3, 394-5
31. Ranson MK (2001). Health insurance in India. *Lancet*, 358, 1555-6.
32. Roy B (2004). Tobacco which kills 5 million people a year must be banned. *The Times of India*, 15, 5.
33. Sharma DC (2004). Cancer institute at Chennai: a model for resource poor countries. *Lancet Oncol*, 5, 204.
34. Shukla Y and Pal SK (2004). Complementary and alternative cancer therapies: past, present and the future. *Asian Pacific J Cancer Prev*, 5, 3-14.
- Stewart BM, Kleinues P (Eds.) (2003). *World Cancer Report*, IARC Press, Lyon.
35. Turner NJ, Howard RA, Mulley GP, Selby PJ (1999). Cancer in old age-is it inadequately investigated and treated? *BMJ*, 319,309-12.
36. Ronald Piana, (2012), "Cancer Care in India: Complex Challenges in a Populous Nation, A Conversation with Rakesh Chopra, MD", May 15, 2012
37. Hyuna Sung , Jacques Ferlay , Rebecca L. Siegel , Mathieu Laversanne , Isabelle Soerjomataram , Ahmedin Jemal , Freddie Bray , (2021), "Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries", <https://doi.org/10.3322/caac.21660>
38. McDermott E, Selman L, Wright M, Clark D.(2008), Hospice and palliative care development in India: A multimethod review of services and experiences. *J Pain Symptom Manage*. 2008; 35:583–93.
39. Mohanti BK(2011), "Research focus in palliative care", *Indian J Palliat Care*. 2011;17:8–11.
40. Kumar SK, (2007), Kerala, India: A regional community-based palliative care model. *J Pain Symptom Manage*. 2007;33:623–7.