# World Chronicle

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## RADIOTHERAPY TREATMENT OF CANCER IN DEVELOPING COUNTRIES

Treating cancer is difficult in the best of circumstances. In developing countries, however, there's an added problem: little or no access to radiotherapy treatment that can save lives and relieve pain. As life expectancy in developing countries improves, the cancer treatment crisis is becoming more acute. Can the International Atomic Energy Agency (IAEA) help needy countries with equipment and trained personnel? How expensive is adequate radiotherapy technology? Is there a chance that radioactive material for medical use can be re-purposed by terrorists to make a 'dirty bomb'? These are some of the issues discussed in this edition of **World Chronicle** with Dr. Bhadrasain Vikram, a radiation oncologist with the International Atomic Energy Agency in Vienna.

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**ANNOUNCER:** From the United Nations in New York, an unedited interview programme on global issues. This is **World Chronicle.** And here is the host of today's **World Chronicle**.

**FOUKARA**: Hello, I'm Abderrahim Foukara and this is **World Chronicle**.

Treating cancer… it's difficult in the best of circumstances but in developing countries there's an added problem: little or no access to radiotherapy treatment that can save lives and relieve pain. Here today to talk about the challenge of radiotherapy treatment of cancer in developing countries is Dr. Bhadrasain Vikram of the International Atomic Energy Agency, IAEA.

Dr. Vikram, welcome to **World Chronicle**.

**FOUKARA:** When people usually talk of the International Atomic Agency, your agency, what comes to mind immediately is nuclear inspections – Iraq, Libya, countries like that, North Korea – not cancer treatment. How significant is this part of your work and what does it exactly consist of?

**VIKRAM**: It is actually becoming much more significant as the magnitude of the cancer problem in developing countries is being realized. And we estimate, for example, that over the next 20 years or so nearly 100 million patients in developing countries will require radiotherapy for cancer and, unfortunately, the way the resources are, less than one-fourth of them will have access unless something is done to increase the access. And because radiation treatment is such a crucial component of cancer treatment today the International Atomic Energy Agency is taking a significant role, in cooperation with the World Health Organization, the International Agency for Research on Cancer, to provide a comprehensive cancer control strategy for developing countries that includes prevention where possible, early diagnosis of those cancers where early diagnosis is possible, the treatment, of which radiotherapy is a major component, and then also end-of-life care for those patients who, unfortunately, are not amenable to curative treatment. So as the magnitude of the problem has come to the consciousness of the international organizations the IAEA is taking a more and more pro-active role in this area.

**FOUKARA**: Well, joining us in the studio are James Wurst of *UN Wire*, and Thalif Deen of the *InterPress Service*. Thalif….

**DEEN:** What I've observed from what I've been reading it looks as if one of the reasons is for most of these countries their health budgets are pretty small because they don't have enough money to spend on health and nutrition and medical care. In the 1995 Social Summit there was something called the "20/20 Initiative". The developing countries were told to specifically earmark 20% of their budgets, national budgets, for health care and

Western donors were told that 20% of their aid should be allocated to health and education. Whatever happened to this initiative in relation to what you're doing?

**VIKRAM**: That's a good question but the reality is that today there are more cancer cases in developing countries than in developed countries. There is a widespread perception, even in the developing countries, that cancer is a problem of rich nations. This is no longer true. There are already more cases every year in developing countries than there are in developed countries. Furthermore, the projections from the World Health Organization are that whereas the number of cancer cases in developed countries is going to remain flat for the next several decades, in developing countries it's going to rise dramatically. In fact, it's going to almost double over the next 20 years. So this is becoming a very major problem for developing countries. You are absolutely right that in the past for many of them cancer has been low on their health care agenda and on the health care budget but, unfortunately, they can no longer afford to turn their heads away from this problem because it is really becoming a very major problem in many, many developing countries.

**DEEN:** And these machines are very expensive are they by developing countries' standards?

**VIKRAM**: The machines are expensive in the sense that setting up a facility for radiotherapy costs in the neighbourhood of one million dollars. Now that sounds like a lot of money but it has a life span of 20 to 25 years. So over that 20- to 25-year life span you can literally treat tens of thousands of patients with it so actual treatment costs per patient are very low. Of course, if you treat only one patient the cost of the treatment will be a million dollars but if you are able to treat tens of thousands of patients then the cost becomes very modest. And we feel that this is something, again, that needs to be brought to the consciousness of the decision makers in developing countries, as well as donor countries, to make sure that this lifesaving technology is not regarded as an expensive luxury for developing countries but an essential component of their health care strategy for coping with cancer because cancer is one of the major killers in developing countries, even today, and the problem is getting worse every year.

**WURST:** As you say, each machine will cost about one million dollars, how many machines are you ideally hoping to acquire and roughly what kind of geographic distribution are you looking at? How many people would the machine serve?

**VIKRAM**: I would like to preface that by saying that certainly more machines are required but this is not primarily a machine issue. There are about maybe a little more than 2,000 such facilities in developing countries today and the biggest problem right now is that many of them are being under-utilized because there is not enough trained staff to use them.

So patients have to wait sometimes months to get treatment and for some of them it's too late by the time they get around to the head of the waiting list. So one of the highest priorities is to train more people so that even the existing facilities are able to be utilized for the benefit of more patients, they are properly maintained, they are run safely, and the waiting list can be shortened by training more people without increasing the number of machines. Now having said that, even with a modest approach to what is available in, for example, Western Europe today we think that developing countries need about another 3,000 machines over the next 10 to15 years in order to be able to cope with this growing problem.

**FOUKARA**: Dr. Vikram, just to go back to the point about the perception. You said that there was a perception that this problem of cancer is more an affliction in the richer countries than in the developing countries. Where do you think that perception originally came from and within the group of developing countries would you say that some parts of the developing world are more afflicted than others?

**VIKRAM**: Certainly. I think it's historically true that there were more cancer cases in developed countries than developing countries and the reason for that is very simple. If you don't live long enough to get to the age of 30, 40 or 50 then you are not likely to get cancer. Cancer really starts becoming a problem when the population's life expectancy increases to 40, 50 and 60 years. So in a way this growing crisis is the price of success in controlling many communicable diseases – women are not dying in childbirth as often and therefore they're living long enough to develop cervix cancer and breast cancer. So the biggest reason behind this increase in cancer cases is that people in developing countries are simply living longer and reaching the age when cancer becomes a major problem. The second big problem of course is the use of tobacco and I think everything that can be done to curtail or prevent the use of tobacco should be supported by everybody who feels that something should be done about all the diseases that tobacco is responsible for, not only cancer but also heart disease and many other kinds of respiratory diseases. So the number of cases that can be prevented, it is estimated that about one-third of cancers could be prevented with a concerted effort on tobacco control, perhaps lifestyle change, but that still leaves a very large number of cancer cases which, for the foreseeable future, cannot be prevented. Now there are many people working on other preventive strategies, like vaccines for certain kinds of cancers, but it will be several decades before we are able to see whether these will be effective in preventing cancer or not. And, as I said in the beginning, over the next 20 years alone we expect that about 100 million patients will require treatment by radiotherapy and we need to do something now in order to prevent this catastrophe.

**FOUKARA**: And in a country like India, for example, where the cancer incidence is relatively high why is that? Why is it so high in India and how does it compare with other parts of the developing world? How does India compare with other parts of the developing world?

**VIKRAM**: Well, India is a very large country with many different socio-economic groups and the first consideration, as I said, is that as people live longer they are more likely to get cancer. There are certain habits that are peculiar or perhaps more prevalent in the Indian sub-continent than some other parts of the world. For example use of betel nut, or what's called "gutka", which is a formulation of betel nut and tobacco with certain flavourings, which actually attracts children, in very nice shiny packages that you can buy very cheap on the street corner. And this has led to a substantial number of cancers of the mouth and throat because these are the areas that are most exposed to the carcinogens in these compounds. Like many other developing countries the number of people using cigarettes in India has also increased rather substantially over the last few decades and, unfortunately, as a result of that many more people are getting lung cancer. So in women the number one cancer, I think, still is cervix cancer in most parts of not only India but the developing countries in general. And this is, we know, related to the Human Papilloma Virus (HPV) that infects women at a relatively early age and over a period of years and decades the infection by the Human Papilloma Virus leads to the development of cervix cancer.

**DEEN**: Speaking of tobacco, the commonest form of cancer we are told is lung cancer and increasingly most of these cigarette companies, which are gradually being driven out of countries like the United States and Europe, they are dumping their cigarettes in developing countries. And don't you think this will cost more cancer in developing countries?

**VIKRAM**: Absolutely. And we are very much concerned about it. In fact, the Director-General of the World Health Organization issued an appeal last year for all international organizations and all countries to support the framework convention on tobacco control and ours was one of the first international organizations to endorse that. So we strongly believe that if tobacco disappeared from the scene tomorrow that over the next 20-30 years lung cancer would become a very rare disease, as it used to be about 100 years ago. So this definitely should be a high priority item for all developing countries to curtail the use of tobacco, especially by young people, because if you get addicted to tobacco at a young age then it's very, very hard to quit.

**WURST**: Now you already said that longevity and tobacco are major causes, what about environmental changes in environment – you know, industrial pollution, maybe food additives, ozone depletion? How much is this sort of thing also involved in the increase or the likely increase in cancer?

**VIKRAM**: As best as we know these are responsible for a relatively small proportion of the cancer. There's a very large number of cancers for which today we really don't have a good understanding of what causes them. I would say two very good examples are breast cancer and prostate cancer and breast cancer in many parts of the world, including the developing world, is becoming the most common cancer of women. Prostate cancer is increasing in men even in developing countries, especially in Western Africa, as the men are starting to live longer. So there are many kinds of cancers for which we don't know the cause, many common cancers. As I said, tobacco is a major cause. For cervix cancer, we know that the Human Papilloma Virus infection is a major cause; for liver cancer we know that the Hepatitis B and perhaps Hepatitis C viruses are major causes, which gives some hope that in a few decades vaccinations against these viruses will be able to prevent these two common cancers. But it will be a few decades before we get there. For most of the other common cancers we really don't know what causes them and while there's a lot of interest in environmental issues I think the link by and large between the common cancers and environmental causes is relatively weak and not very – there is not robust, scientific evidence saying that this is the major cause of these cancers.

**FOUKARA**: This is **World Chronicle**. We're talking with Dr. Bhadrasain Vikram about how to treat millions of people with cancer in developing countries. Let's take a look at this report on radiotherapy treatment in Kazakhstan:

**VIDEO ROLL-IN**

**NARRATION**: This is perhaps the greatest threat to life on earth. Yet, during the Cold War years, the nuclear powers tested hundreds of atomic bombs in different regions of the world.

The Semipalatinsk region of Kazakhstan is where the former Soviet Union tested its atomic arsenal. Even though tests are no longer held, serious problems remain. One is radiation. This lake was created from atomic explosions. The radiation level here is 200 times higher than the average in Kazakhstan.

It's a major ecological disaster says Herbert Behrstock, the United Nations Coordinator in Kazakhstan…

**BEHRSTOCK**: "The environmental situation in Semipalatinsk is probably unique in the world. Having sustained 40 years of nuclear testing, with hundreds of explosions above ground and continued leakage of some nuclear contaminants and radiation at ground level, there certainly are heavy doses of plutonium around. There are remains of strontium and caesium".

**NARRATION**: The village of Sachal is located close to where the tests took place. As the hundreds of thousands who worked on the test site left the region economic activity shrunk drastically.

The Beibitaev family has lived here for many years. Since he was a baby, Markem has suffered from skin diseases. His father died of cancer, his sister is mentally ill. Markem attributes these problems to the nuclear explosions.

**BEIBITAEV**: "Nobody told us about the test site. When we were children we got excited when the tests were conducted. Later we realized how dangerous they were. Now we know".

**NARRATION**: Markem often visits Sachal's clinic. Dr. Bayal Imangaleva, the head doctor, knows well the effect of radiation in humans. Cases of mental diseases, cancer, anaemia and spontaneous abortions are officially reported to be two to three times more frequent around Semipalatinsk than elsewhere in Kazakhstan.

**DR. IMANGALEVA**: "My professional opinion is that the population of Sachal is sick. Practically, we cannot find a single healthy person in this village. Every person has this or that kind of disease or several diseases. We can observe pathology in every villager".

**NARRATION**: A lack of screening programmes has undermined the ability for early detection of health problems. Unfortunately, the majority of cases of cancer, for example, are being diagnosed at a later stage when treatment is more costly and least likely to be successful. Even the current radiotherapy units available rely on equipment that is almost 40 years old.

The United Nations system is assisting the government of Kazakhstan in establishing coordinating mechanisms for helping with international assistance. Urgent aid is needed if those innocent victims who happen to be born in the Semipalatinsk region are to have healthy and fruitful lives.

**VIDEO OUT**

**FOUKARA**: Dr. Vikram, that report was made sometime ago, do you know if the situation in Kazakhstan has improved much since in terms of cancer treatment? And can you talk about the status of the technology now available in that part of the world for dealing with cancer?

**VIKRAM**: Well, most of the information regarding radiation and causation of cancers actually comes from Hiroshima and Nagasaki and, more recently, from Chernobyl. And there is an expert group convened by the World Health Organization which is meeting this year to try and put especially the Chernobyl data in perspective and to make clear cut conclusions and I

would not like to pre-judge their findings. I think it will be available by the end of this year, maybe early next year but just to reiterate what I said earlier that environmental causes, including environmental radiation, are responsible for a small minority of the cancers in the world and in developing countries. The great majority of cancers, we just don't know the cause or if we know their cause – for example smoking – we have not been very successful in countering that cause and we need to do more. And other cancers like liver cancer and cervix cancer, while we have a strong suspicion about the relationship with the virus, the technology is not yet ready in order to make a major impact on preventing these cancers. So we are left with having to deal with finding these cancers early and treating them with available technology which, fortunately for many of the common cancers like breast cancer, cervix cancer, nasal-pharynx cancer – which is very common in Southeast Asia and North Africa and it's a cancer in the area behind the nose and the eyes – in fact if you find them early treatment is very effective and cure rates can be quite high. So I think for the next 20, 30, 40 years we still need to focus on finding these cancers early and making sure that treatment is available in a timely fashion.

**DEEN**: Speaking of the environment, we have heard reports that some of the military forces are using cancer-causing depleted uranium. In Kosovo they used it, in the first Gulf War they used it and they are using it in the war. Has the IAEA done any studies on this?

**VIKRAM**: Yes, the IAEA has done studies on depleted uranium. I don't claim to be an expert on that but from what I know the problem is actually not the uranium part – sorry it's the chemical uranium and not the fact that there is any radioactivity associated with it. Once again, keeping things in perspective, this is not a major cause of these hundreds of millions of cancer patients worldwide. Most of the cancers, we don't know the cause or we know that the cause is related to smoking, or to viruses like Human Papilloma Virus or Hepatitis virus. For a very small minority of cases the causes are environmental, like environmental radiation and chemicals in the environment.

**FOUKARA**: Dr. Vikram, the countries like Kazakhstan that we've just seen, other countries where as it's just been mentioned depleted uranium has been used and these perhaps are related to cancer incidence, do these countries have the necessary amount of adequate equipment to deal with those situations and identify what sort of cancer it is and what sort of equipment it needs to be dealt with?

**VIKRAM**: The short answer is no. The facilities are either very limited or non-existent. I guess the worst situation is in Africa where there are about 25 countries that don't have a single radiotherapy facility. In most other regions of the world – Central America, Latin America, Eastern Europe and most parts of Asia – almost every country has at least one

radiotherapy facility but then given the size of the country and the size of the population and the size of the number of cancer patients in the future those are grossly inadequate. And, as I've said, we need about 3,000 additional machines but even more urgently we need to train enough people that they are able to treat with the existing equipment more patients with cancer. In many cases the number of cancer patients that can be treated can be doubled by employing enough trained people.

**FOUKARA**: Just to tie in what you've been saying, Ethiopia, a country of 60 million people, has only one radiotherapy machine. It's a rather shocking statistic.

**VIKRAM**: That is correct and the patients come from very long distances and sometimes wait for months. And, as I said before, sometimes by the time they get to the head of the waiting list it's too late for them. So that's certainly a country which needs a lot of help.

**WURST**: The video also raises another point, you know, beginning with the nuclear test numbers. Really very few people relatively have been affected or have gotten cancer through nuclear testing but a security issue that does come up, particularly these days, is the idea of a radiological weapon; the idea of rather traditional, a Hiroshima-type nuclear explosion, a conventional explosion, using low-level radioactive material that could – the dispersal of radiation. Now, your machines use radioactive material, is it the kind of material that could be first of all be useful in a radiological bomb, and second of all, what kind of security, what kind of safeguards do you have on these machines to be sure that the radioactive material is used for medical rather than military purposes?

**VIKRAM**: Well, I think that is one of the reasons why we have the understanding with the World Health Organization that IAEA should be taking the lead in the field of cancer treatment with radiotherapy because the IAEA has a long tradition, almost 30 years experience, in providing this technology to developing countries, establishing the regulations and the legislation as well as the infrastructure to enforce safety and proper use, and I can't that emphasize enough. What prevents problems are trained people, people who know how to use the technology safely and who know what they are doing. And we have been very heavily invested in providing training, both with regard to the radiation protection infrastructure as well as the safe use of technology for treating cancer patients. Now, having said all that, there's clearly a greater problem since September 11th because of this great concern about dirty bombs. Many people believe that a dirty bomb is dangerous because it's a bomb, not because it's dirty. But still I think we need to do everything possible in order to prevent the radioactive material from falling into the wrong hands. However, we don't want to become so restrictive that we make it even more difficult for developing countries to obtain access to this technology. Not all the technology I'm talking about is radioactive. Some of it is and I think the IAEA has

both the policies, procedures and the infrastructure in place to be able to help developing countries in implementing this technology in a way that is considered safe.

**FOUKARA**: Dr. Vikram, we have less than two minutes and I would like to ask a follow-up. The Secretary-General of the United Nations, Kofi Annan, recently has been saying that while weapons of mass destruction are seen in the developed world as the prime menace in the developing world there are other problems that constitute the prime menace, such as disease – whether it's HIV or cancer – or other types of menace, like poverty for example. In the case of radiotherapy how can the UN make sure that providing equipment and programmes to deal with this problem of cancer is adopted as a development goal without necessarily undermining what the developed world is trying to do in the wave of fighting against weapons of mass destruction?

**VIKRAM**: Well, the framework is already there. Under the Millennium Development Goals there is a call to get rid of scourges of humanity of the major diseases, and cancer is a major disease. It's one of the most common causes of death in the world today and produces untoward suffering and pain and therefore the framework is already there under the Millennium Development Goals. Now, the infrastructure is in place at the IAEA, in collaboration with the World Health Organization, to do something about the cancer problem. Of course, we lack the resources and that's why we are publicizing this problem to raise the awareness of stakeholders, both in developing countries and developed countries, that perhaps more resources need to be allocated for this particular problem.

**FOUKARA**: Dr. Vikram, thank you for being with us on this edition of **World Chronicle**. Our guest has been Dr. Bhadrasain Vikram, a radiation oncologist who is leading the IAEA's efforts to provide radiotherapy treatment of cancer in developing countries.

He was interviewed by James Wurst of *UN Wire* and Thalif Deen of *InterPress Service*. I'm Abderrahim Foukara, thank you for joining us. We invite you to be with us for the next edition of **World Chronicle**.

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