

Bathinda-Bikaner 'cancer' train and role of pesticides in agriculture

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At 9.30 pm every night, a poorly-lit, 12-coach train pulls out of Bathinda station in Punjab with passengers of all ages and genders. With their meagre belongings and plastic packets containing sheaves of papers and documents, most talk among themselves in hushed tones.

The destination for an average one-third of the 300 passengers is the Acharya Tulsi Regional Cancer Hospital and Research Centre in the Bikaner district, in Rajasthan.

The train covers about 325 km before it reaches Bikaner around 6 am. Sometimes the train is delayed by one to two hours. But the passengers do not lose hope.

Over the years, the Bathinda-Bikaner train has earned itself a grim tag as 'Punjab's cancer train' as it ferries hundreds of thousands of cancer patients from this northern state for treatment for this dreaded affliction.

The reason for this interstate migration is the cost of cancer treatment.

The cost of a train ticket is free for any cancer patient while for attendants there is a 75% discount on the fare.

Most of the hospitals in Bikaner city are covered under Mukh Mantri Punjab Cancer Raahat Kosh Scheme through which patients can get financial assistance up to Rs 1,50,000 (\$1,787). Whereas the scheme is much harder for patients to access in Punjab.

Cancer capital

The widespread prevalence of cancer in Punjab — and more recently in adjoining Haryana — has helped earn India the unenviable title of the world's cancer capital.

There are many reasons for poor health among Punjab's population but environmental degradation and water, soil, and air pollution are known to be the most common causes of cancer in India.

Cancer cases in the country are at an all-time high, after public officials shared in Parliament earlier this year that there were 14,96,972 cases in 2023 up from 14,61,427 in 2022. There was a record 300% rise in cases between 2017 and 2018.

Studies indicated that 1.4 million people had cancer in India in 2020 and the case numbers may rise to 1.57 million by 2025. The reason for this spike may be due to changes in food consumption patterns, increased genetic predisposition to the disease, as well as negligence in seeking medical attention at the onset of cancer.

Another report indicates that Punjab saw a four-time rise in cervical, oral, and breast cancer cases among people over 30 in 2022.

A Forbes India report indicates that Haryana and Punjab have shown moderate economic growth, notching up per capita net state domestic products of Rs 3,25,000 (\$3,879) and Rs 1,95,000 (\$2,327) respectively in the financial year 2022-2023.

So rising cancer cases may not be directly linked with economic hardship.

Green revolution's hidden dark side

Beginning in the 1960s, Haryana and Punjab were two of the prime beneficiaries of the 'Green Revolution' that solved India's food security problem.

The primary outcome of this scientific and agricultural reform was improvement in crop yields. However, this transformation relied extensively on the increased use of fertilisers and pesticides.

This excess use of pesticides is known to be the major cause of cancer cases in Haryana and Punjab.

Cancer occurs when a cell keeps on growing and dividing uncontrollably, unlike normal cells which ultimately die. Biochemically, humans have natural protection against cancer through tumour-suppressor genes. Exposure to certain chemicals can mutate tumour-suppressor genes, switching them off. Chronic exposure to pesticides can thereby increase people's risk of developing cancer.

Consuming a staggering 5,270 metric tonnes of pesticides annually, Punjab is the third largest user and has the highest per capita consumption of such chemicals in India.

This high usage results in the accumulation of pesticides in groundwater, drinking water and food. Such contaminants then end up in the human body.

Recent research found pesticide traces in the breastmilk of lactating mothers in Haryana.

Another study showed that in 6.9% of cow's milk samples from Ludhiana in Punjab, the concentration of harmful pesticides such as hexachlorocyclohexane, dichloro-diphenyl trichloroethane (DDT), endosulfan, cypermethrin, cyhalothrin, permethrin, chlorpyrifos, ethion, and profenophos were higher than acceptable limits.

Other research indicates the presence of metal pollutants such as arsenic, lead, and uranium in the groundwater of Punjab's Malwa, may also have played a role in the high incidence of cases in the region.

The cancer cost of agricultural chemicals

This raises a dilemma: whether the use of such chemicals for improving agricultural production should be prioritised given their impact on people's health and quality of life.

This cancer disease burden also comes with an economic cost.

The cost of surgeries related to cancer ranges between Rs 1,00,000 (\$1,193) to Rs 6,00,000 (\$7,160) depending on the affected organ.

In 2017-2018, Punjab's per capita health expenditure was around Rs 1,086 (\$13), lower than the national average at that time. On average, people covered around 69.4% of their out-of-pocket health costs, which was higher than the national average of 48.8%.

One way of addressing this serious issue is through a One Health approach.

This concept focuses on looking at human health not separately but as part of an integrated and unified whole alongside the health of animals and ecosystems.

An integrated pest management programme complies with this concept and can help address the issue of pesticide overuse by using ecologically sustainable methods to control pests. Agricultural land can be made ecologically inhospitable for pests, requiring minimal pesticide use.

This will reduce the chemical footprint of agriculture and won't pollute the air, water, or soil with pesticides.

Such interventions could encounter major challenges from farmers who are used to chemically-intensive agricultural methods and practices, which is why it's important to understand the ecological conservation behaviour of farmers before implementing such solutions.

But they could be the first step towards a lasting solution to the problem of cancer caused by excessive pesticide use.

(Abhiroop Chowdhury is executive dean, Jindal Global School of Environment and Sustainability, O P Jindal Global University, Sonapat, Haryana.)

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