

1. Takeaways from Gol's report on road accidents

Introduction

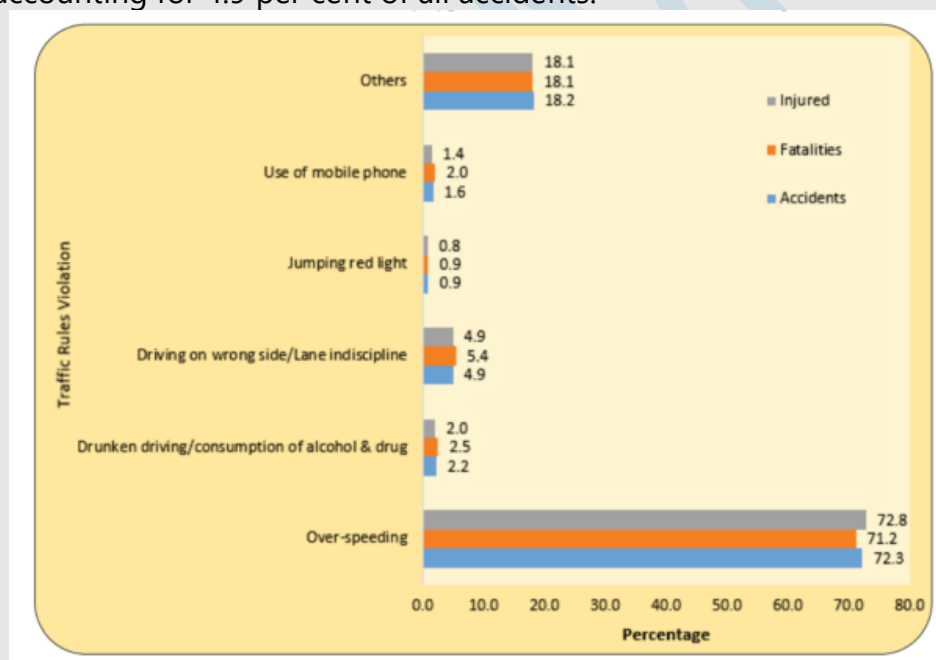
The Ministry of Road Transport and Highways released their annual report on October 31 titled 'Road Accidents in India – 2022'.

As per the report, a total of 4,61,312 road accidents have been reported by States and Union Territories (UTs) during the calendar year 2022, which claimed 1,68,491 lives and caused injuries to 4,43,366 persons. This marks an increase of 11.9% in accidents, 9.4% in fatalities, and 15.3% in injuries compared to the previous year.

Here are key takeaways from the report.

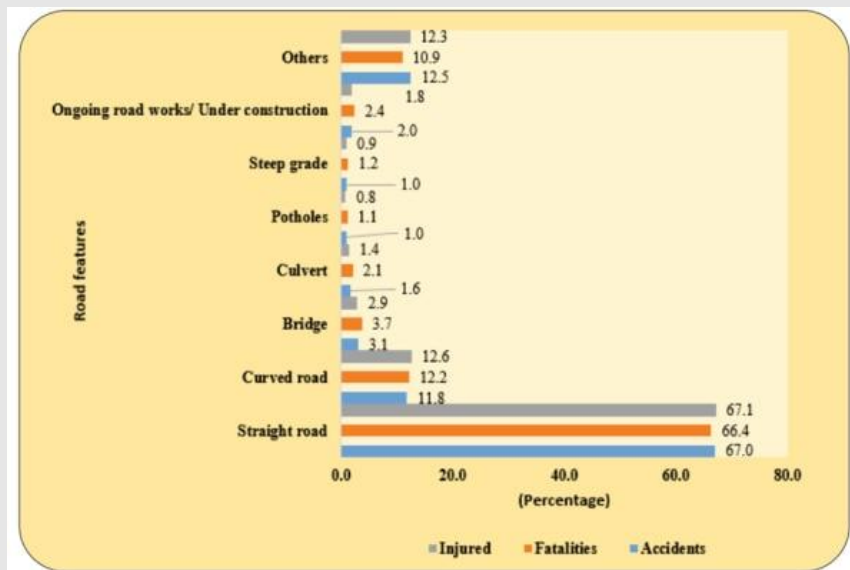
1. Over-speeding is the biggest killer

In 2022, over speeding accounted for 72.3 percent of the total road accidents. Driving on the wrong side was the second highest cause of the total road accidents in 2022, accounting for 4.9 per cent of all accidents.



2. Most accidents occurred on straight roads

As per the data, 67 per cent of all accidents occurred on straight roads. This is over four times the total number of accidents that took place on curved roads, roads with potholes, and roads having a steep gradient, combined (13.8 per cent).



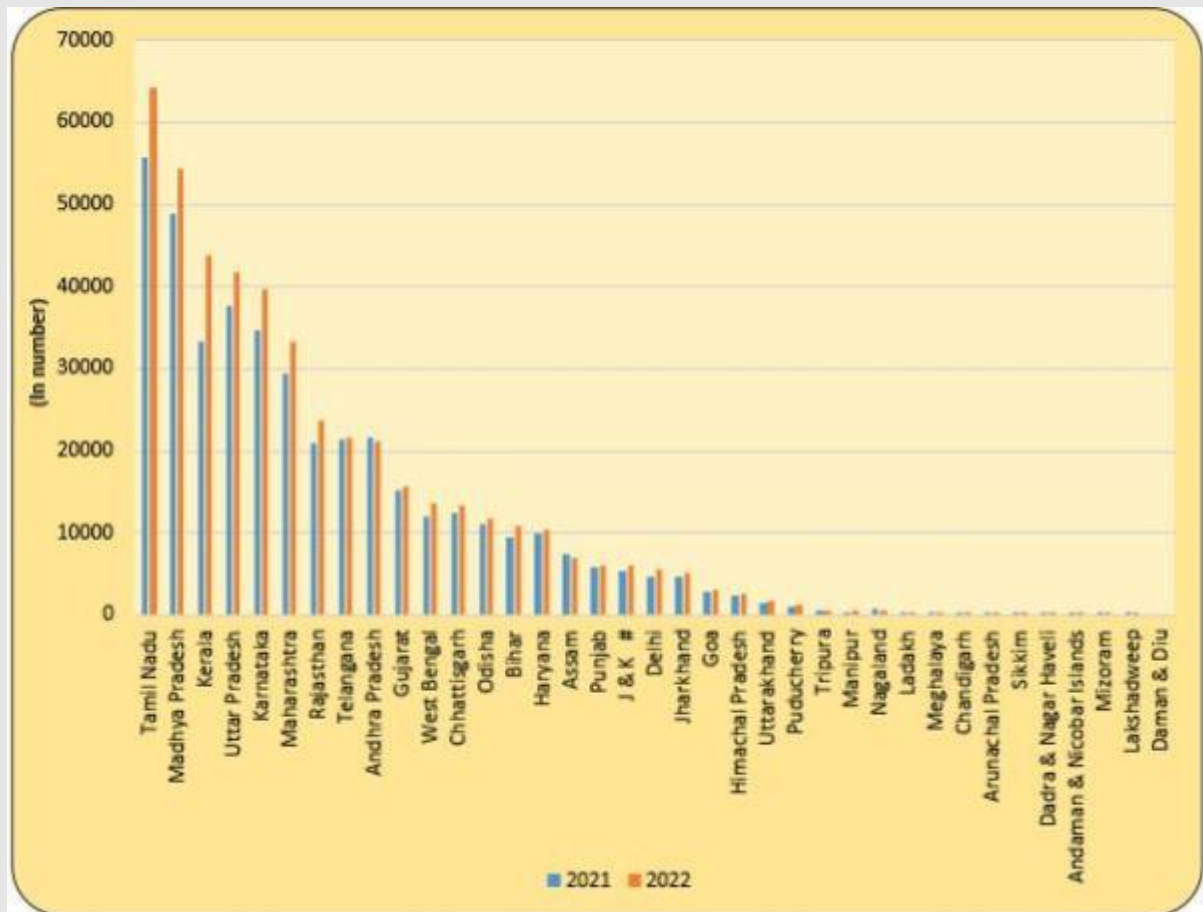
3. Highest fatality rate in Sikkim, lowest in Ladakh, Daman & Diu

Fatality rate is used to explain road accidents relative to vehicular population in a given location. It is measured by the number of road accident fatalities per 10,000 vehicles. Sikkim reported the highest fatality rate, standing at 17. UTs Ladakh and Daman & Diu had the lowest fatality rate at 0. The all-India rate stood at 5.2.



4. Tamil Nadu reported highest number of accidents

Tamil Nadu reported 64,105 total accidents, 15.1 per cent up from the previous year. This accounted for over 13 per cent of total accidents reported in India. At the next spot was Madhya Pradesh, which reported 54,432 accidents.



Relevance: GS Prelims

Source: The Indian Express

2. Inauguration of rail link connecting Northeast India with Bangladesh

Introduction

Prime Minister Narendra Modi and his Bangladesh counterpart Sheikh Hasina virtually inaugurated a rail link connecting Northeast India with Bangladesh. The Agartala-Akhaura project will cut down the travel time between Agartala and Kolkata too, from 31 hours to 10 hours.

The project is expected to boost tourism, trade, and people-to-people exchanges between the two countries.

What is the project?

In the 12.24-km Agartala-Akhaura railway line, 5.46 kilometres lie on the Indian side in Tripura, and 6.78 km in the Akhaura upa-zilla in Brahmanbaria district of Bangladesh. The train will start from Agartala and move to Nischintapur, on the Indian-Bangladesh border, where the immigration checks will be held. The first station on the Bangladesh side will be Gangasagar.



Who executed the Project?

The Indian Railway Construction International Limited (IRCON), a Public Sector Undertaking (PSU) under the Indian Railways, did the work on the Indian side, and Texmaco, a private Indian firm, implemented the work on the Bangladesh side.

Why is the project important to Tripura?

For land-locked Tripura, any connectivity project is of great practical significance. Due to the Agartala-Akhaura railway project, the distance between Agartala and Kolkata will be effectively reduced from 1600 km to 500 km.

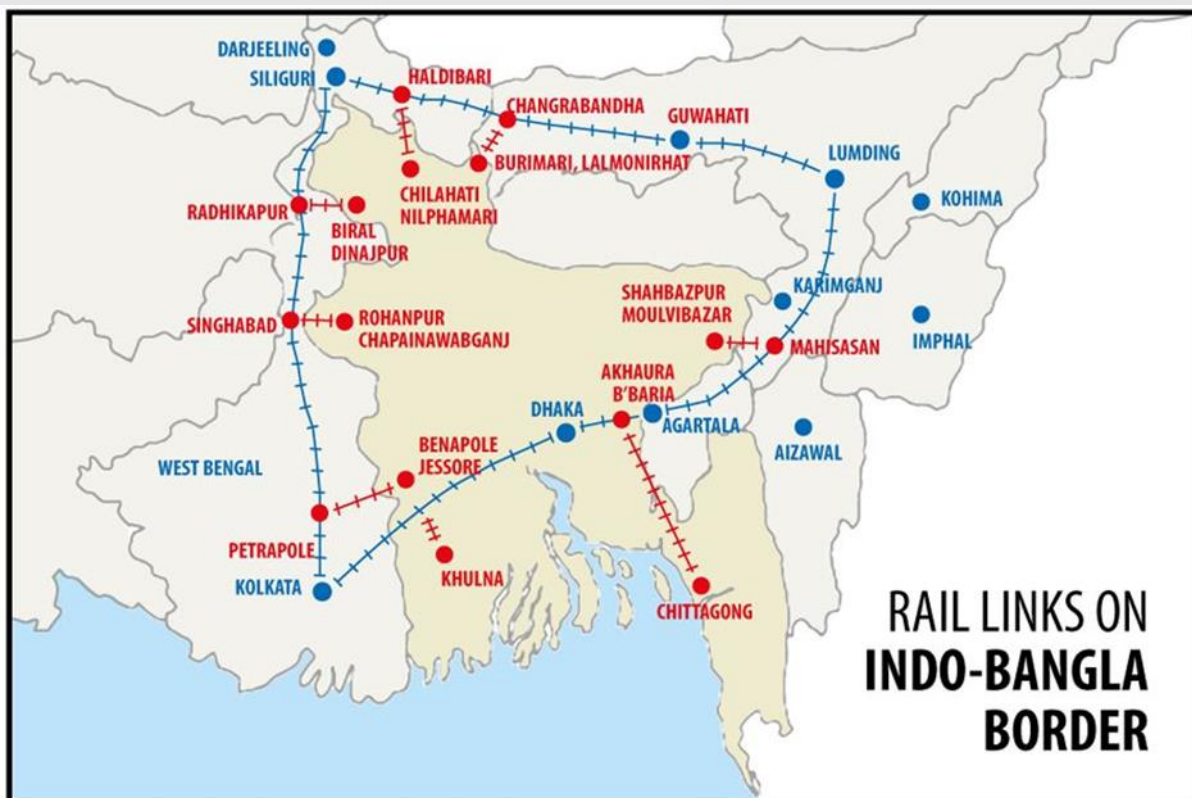
However, connectivity with Bangladesh also holds emotional significance. Tripura shares an 856-km international border with Bangladesh, the second highest after West Bengal. The North Eastern state is surrounded by the country on all three sides except Assam on the fourth. During the 1971 Indo-Pakistan war and the creation of Bangladesh, Tripura, a state which then had only 14 lakh people, sheltered nearly 15 lakh East Pakistani refugees. It ran at least 8 major muktijoddha (liberation warrior) training camps. With the new connectivity project, people on both sides can now hope for closer and smoother ties.

What other trains run between India and Bangladesh?

The latest train service is part of an ongoing effort to boost connectivity between India and Bangladesh over the past few years. Three trains, the Bandhan Express, the Maitree Express and the Mitali Express, run between West Bengal and Bangladesh.

The Bandhan Express reboots an old rail link between Kolkata and Khulna, the third-largest city of Bangladesh. Until the 1965 war between India and Pakistan, this route was served by the Barisal Express. The governments of PM Modi and Sheikh Hasina restarted the service in 2017. The Bandhan uses the Petrapole-Benapole border crossing.

The Maitree Express between Kolkata and Dhaka Cantonment started in April 2008. The Mitali Express, announced by PM Modi during his visit to Dhaka in March 2021, connects Siliguri in North Bengal with the Bangladesh capital.



Relevance: GS Prelims & Mains Paper II; International Relations

Source: The Indian Express

3. India's own CAR-T cell therapy

Introduction

The Central Drugs Standard Control Organisation (CDSCO) this month granted market authorisation for NexCAR19, India's first indigenously-developed CAR-T cell therapy, to ImmunoACT, a company incubated by IIT Bombay. This paves the way for the commercial launch of this therapy in India, where it is expected to be available to cancer patients at a tenth of the cost abroad.


What is CAR-T cell therapy, and how do CAR-T cells find and destroy cancer cells?

CAR-T is a revolutionary therapy that modifies immune cells, specifically T-cells, by turning them into potent cancer fighters known as CAR-T cells. T-cells are special cells (white blood cells that find and fight illness and infection) whose primary function is cytotoxic, meaning it can kill other cells. In CAR-T therapy, we genetically modify them into cancer-fighting cells. These supercharged cells are then put back into the body, and they go after cancer cells — especially in blood cancers like leukaemia and lymphomas.

TREATMENT FOR SPECIFIC B-CELL CANCERS


NexCAR19 is a prescription drug for B-cell lymphomas, lymphoblastic leukaemias when other treatments have been unsuccessful

PATIENT'S WHITE blood cells are extracted by a machine through a process called leukapheresis and genetically modified, equipping them with the tools to identify and destroy the cancer cells.




NEXCAR19 IS manufactured to an optimal dose for the patient, and typically administered as a single intravenous infusion. Prior to this, the patient is put through chemotherapy to prime the body for the therapy.


HOW NEXCAR19 WORKS




T-cells are naturally made by the body as an advanced defence against viruses and cancer cells. As T-cells mature, they develop specific connectors (receptors) to target key signals on cancer cells.



However, cancers can limit the inbuilt extent and efficiency with which T-cells are able to seek and fight them. This results in an increase in cancer burden.



A safe shell of a virus is used to genetically engineer T-cells so they express Chimeric Antigen Receptors — connectors that target a protein called CD19 on B-cell cancer.



Scientists have identified certain proteins that are abnormally expressed on the surfaces of specific types of cancer cells. Specially designed receptors can find and bind to these cells.

Source: ImmunoACT

How effective and different is this from other cancer treatments like, say, chemotherapy?

While chemotherapy and immunotherapy may add a few months or years to a cancer patient's life, cell-and-gene therapy is designed to cure and provide lifelong benefit. It makes treatment easier with a one-time therapy [unlike several sessions of chemotherapy] that can be truly transformative [for a patient]. It's a lifeline for non-responsive cancer patients.

Is NexCAR19 a type of CAR-T therapy?

NexCar19 is a type of CAR-T and gene therapy developed indigenously in India by ImmunoACT, which is a company incubated at IIT Bombay. Our therapy is designed to target cancer cells that carry the CD19 protein. This protein acts like a flag on cancer cells, which allows CAR-T cells to recognise and attach themselves to the cancer cells and start the process of elimination.

Even some developed nations don't have their own CAR-T therapies; they import them from the United States or Europe. India is now one of the first developing countries to have its indigenous CAR-T and gene therapy platform.

Who can get the NexCAR19 therapy?

The therapy is for people with B-cell lymphomas who didn't respond to standard treatments like chemotherapy, leading to relapse or recurrence of the cancer.

The patient's journey starts with a doctor's prescription at the clinic, followed by donation of blood by the patient at a transfusion centre. The blood goes to the lab, where the T-cells are genetically modified. In a week to 10 days, these cells return to the clinic for patient reinfusion. Essentially, patients only need to give a blood sample at their clinic, and come back in 7-10 days for reinfusion.

Recovery typically occurs within two weeks after one cycle of the treatment. In our data, approximately 70% of patients respond to the treatment, with variations between leukaemia and lymphoma cases. About 50% of these responsive patients achieve a complete response.

How much will this treatment cost?

Currently, we are looking at a price range of Rs 30-40 lakh for CAR-T therapy, which we intend to hold. Even at this cost, it may not be accessible to everyone. Our ultimate goal is to bring the cost down to Rs 10-20 lakh. As technology matures and manufacturing processes improve, we anticipate that the cost will decrease. We're committed to making this therapy accessible to as many people as possible.

Will the treatment be covered by insurance?

When a therapy is approved by regulatory agencies like CDSCO or DCGI, it typically should be covered by national insurance schemes and private insurance companies. However, since this is an expensive treatment, the extent of coverage and accessibility to insurance may vary.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: The Indian Express