



## Using AI in Elections

**For Prelims:** [Generative Artificial Intelligence \(GAI\)](#), [Artificial General Intelligence \(AGI\)](#) Deep fake, [World Economic Forum's \(WEF's\)](#), Artificial General Intelligence (AGI).

**For Mains:** Concerns For Using AI for Elections, Generative AI – Benefits, Threats and Way Forward.

**Source:** [TH](#)

### Why in News?

As AI evolves towards mimicking human capabilities evolving from [Generative Artificial Intelligence \(GAI\)](#) to [Artificial General Intelligence \(AGI\)](#), its impact on elections, exemplified by India's upcoming polls, underscores the **imperative of addressing its potential influence**.

- AGI refers to the hypothetical ability of an AI to understand, learn, and apply knowledge in a manner **similar to human intelligence across** a wide range of tasks and domains.
- AGI aims to **replicate the cognitive abilities of humans**, such as reasoning, problem-solving, perception, and understanding natural language.

### How is AI Linked with the Electoral Landscape?

- **Campaign Strategy and Targeting:**
  - Political parties and candidates can use **AI algorithms to analyse vast amounts of data about voters**, including demographics, social media activity, and past voting behaviour, to tailor their campaign messages and target specific voter groups more effectively.
- **Predictive Analytics:**
  - AI-powered predictive analytics **can forecast election outcomes** by analysing various factors such as polling data, economic indicators, and sentiment analysis from social media.
  - This can help **parties allocate resources strategically** and focus on key battleground areas.
- **Voter Engagement:**
  - AI chatbots and virtual assistants can engage with voters on social media platforms, answering questions, providing information about candidates and policies, and even encouraging voter turnout.
  - This can enhance voter engagement and participation in the electoral process.
- **Security and Integrity:**
  - AI-powered tools can be employed to detect and prevent election fraud, including voter suppression, tampering with electronic voting systems, and the spread of disinformation. By analysing patterns and anomalies in data, AI algorithms can help ensure the integrity of the electoral process.
- **Regulation and Oversight:**
  - Governments and election authorities can use AI to monitor and regulate political advertising, identify violations of campaign finance laws, and ensure compliance with

electoral regulations. AI-powered tools can help enforce transparency and accountability in the electoral process.

- In 2021, the **Bihar Election Commission** tied up with AI firm **Stagu** to use **video analytics** with **optical character recognition (OCR)** to analyse CCTV footage from counting booths during the panchayat elections.
- The system enabled the Bihar Election Commission to achieve **complete transparency and eliminate any chances** of manipulation.

## What are the Concerns of Deploying AI for Electoral Purpose?

### ▪ Manipulation of Electoral Behavior:

- AI models, particularly **Generative AI and AGI** can be used to **spread disinformation, create deep fake elections**, and inundate voters with highly personalised propaganda, leading to confusion and manipulation of democratic processes.
- Using AI, Deepfake Videos of opponents **can be created to tarnish their image**.
  - The term "Deep Fake Elections" refers to the use of AI software to create convincing fake videos, audios, and other content that can deceive voters and influence their decisions.
  - This phenomenon poses a serious threat to the **integrity of elections and undermines public trust in the electoral process**.
- One prominent example highlighting the potential dangers of **such manipulation is the Cambridge Analytica scandal**.
  - Cambridge Analytica, a now-defunct political consulting firm, notoriously **exploited Facebook data to create targeted political advertisements** and influence **voter behavior during the 2016 United States presidential election** and other campaigns globally.

### ▪ Messaging and Propaganda:

- AI tools can be **trained to translate in regional languages** which can be used by the candidates for Microtargeting in their campaign.
  - Microtargeting is a marketing strategy that uses recent technological developments and reaching out to specific segments of a larger audience based on **detailed demographic, psychographic, behavioral, or other data**.
- AI can also be used for the **customisation of political campaigns** based on the local dialect and demography of the voter base.

### ▪ Spreading Disinformation:

- The **World Economic Forum's (WEF's) Global Risks Perception Survey**, ranks misinformation and disinformation among the top 10 risks, with easy-to-use interfaces of large-scale AI models enabling a boom in false information and "synthetic" content - from sophisticated voice cloning to fake websites.
  - AI can be used to inundate voters with highly personalised propaganda on a scale that could make the Cambridge Analytica scandal appear microscopic, as the persuasive ability of AI models would be far superior to the bots and automated social media accounts that are now baseline tools for spreading disinformation.
  - The risks are compounded by social media companies such as Facebook and Twitter significantly cutting their fact-checking and election integrity teams.

### ▪ Inaccuracies and Unreliability:

- AI models, including AGI, are not infallible and can produce inaccuracies and inconsistencies.
- There has been public wrath worldwide over Google AI models, including in India, for their portrayal of persons and personalities in a malefic manner, mistakenly or otherwise. These reflect well **the dangers of 'runaway' AI**.
  - Inconsistencies and undependability stalk many AI models and pose inherent dangers to society. As its potential and usage increases in geometric proportion, threat levels are bound to go up.

### ▪ Ethical Concerns:

- The use of AI in elections raises ethical questions about privacy, transparency, and fairness.
- AI algorithms may inadvertently **perpetuate biases present in training data**, leading to unfair treatment or discrimination against certain groups of voters.

- Moreover, the lack of transparency in AI decision-making processes can **erode public trust and confidence in electoral outcomes.**
- Parties having better **resources can have better utilisation of AI** in comparison to the small and regional parties with lesser resources, which may disrupt the **level playing field in the elections.**
- **Regulatory Challenges:**
  - Regulating the use of AI in electoral campaigns presents significant challenges due to the rapid pace of technological advancements and the global nature of online platforms.
  - Governments and election authorities struggle to keep pace with evolving AI techniques and may lack the necessary expertise to effectively regulate AI-driven electoral activities.
  - The primary statutes that could potentially trigger if fake news is spread using deepfakes are, The [India Penal Code, 1860](#) (or the Bharatiya Nyaya Sanhita, 2023 in due course) [Information Technology Act, 2000](#); and the [Information Technology \(Intermediary Guidelines and Digital Media Ethics Code\) Rules, 2021.](#)
    - However, there doesn't exist a specific law **that addresses just AI and deepfake technology** and targeting the individual who creates it.

## How to Deal With the Impacts of AI on Elections?

- **Issuing MCC-like Guidelines to Address the Misuse of AI:**
  - The menace of **misinformation has existed for a longer period**, and the advent of **AI technology has turbocharged** the spread of fake news.
    - In the context of Lok Sabha elections 2024, one possible solution to AI-fueled misinformation would be **guidelines issued by the [Election Commission of India.](#)**
  - There is a need to implement regulations that **require transparency in the use of AI algorithms** for political purposes.
    - This includes **disclosing sources of funding for political advertisements** and requiring platforms to disclose how algorithms determine the content users see.
- **Education and Media Literacy:**
  - Invest in educational programs to teach citizens how to **critically evaluate information online and identify disinformation** and deep fakes.
  - Promote media literacy to help **voters distinguish between credible and unreliable sources** of information.
- **Enhanced Fact-Checking:**
  - Establishing a **Rapid Response Team to address the dissemination** of fake news, deep fakes, and other forms of misinformation during elections is crucial.
    - While it's inevitable that fake videos and misinformation will arise, the key lies in **swiftly addressing them before they escalate and spread widely.**
  - Strengthen fact-checking efforts by providing resources to independent organisations and journalists to verify the accuracy of information circulating online.
  - Develop AI-powered tools to **identify and flag misleading content.**
- **Counter-Narratives and Debunking Campaigns:**
  - Launch public awareness campaigns that debunk false information and provide accurate counter-narratives.
  - Utilise AI to identify trending **misinformation and target counter-messages** effectively.
- **Ethical AI Development:**
  - Encourage the development of AI technologies with ethical considerations in mind, such as minimising bias, protecting privacy, and promoting transparency.
  - Establish standards and guidelines **for the responsible use of AI in political contexts.**
- **International Cooperation:**
  - Foster collaboration between governments, tech companies, and international organisations to address the global challenges posed by AI-driven disinformation campaigns. Share best practices and coordinate efforts to combat election interference across borders.

## What are India's Initiatives Related to Artificial Intelligence?

- [INDIAai.](#)
- [Global Partnership on Artificial Intelligence \(GPAI\).](#)

- [US India Artificial Intelligence Initiative.](#)
- [Responsible Artificial Intelligence \(AI\) for Youth.](#)
- [Artificial Intelligence Research, Analytics and Knowledge Assimilation Platform.](#)
- [Artificial Intelligence Mission.](#)

## Conclusion

- Elections apart, **India being one of the most advanced countries** in the digital arena, again needs to treat AI as an unproven entity.
- While AI brings benefits, the nation and its **leaders should be fully aware of its disruptive potential.**
- This is especially true of AGI, and they should act with due caution. India's lead in digital public goods could be both a benefit as well as a bane, given that while AGI provides many benefits, it can be malefic as well.

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

### **Prelims:**

**Q. With the present state of development, Artificial Intelligence can effectively do which of the following? (2020)**

1. Bring down electricity consumption in industrial units
2. Create meaningful short stories and songs
3. Disease diagnosis
4. Text-to-Speech Conversion
5. Wireless transmission of electrical energy

**Select the correct answer using the code given below:**

- (a) 1, 2, 3 and 5 only  
(b) 1, 3 and 4 only  
(c) 2, 4 and 5 only  
(d) 1, 2, 3, 4 and 5

**Ans: (b)**

### **Mains:**

**Q. What are the main socio-economic implications arising out of the development of IT industries in major cities of India? (2021)**

## Climate Finance Road to COP29

**For Prelims:** [Loss and Damage Fund](#), [Conference of the Parties \(COP 28\)](#), [New Collective Quantitative Goal](#), [Fossil Fuels](#)

**For Mains:** Climate Finance and its Significance, Environmental Pollution & Degradation

[Source: IE](#)

## Why in News?

The [UN Climate Change Conference \(UNFCCC COP 27\)](#) convened in **Sharm El-Sheikh, Egypt** established a [Loss and Damage Fund](#) for **climate disaster recovery** in developing nations.

- The [2023 UNFCCC COP 28 \(Dubai\)](#) focused on transitioning from **fossil fuels**, pledging to **triple renewable energy capacity by 2030**.
- As preparations for COP29 in Baku intensify, attention now turns to finance discussions, particularly the **New Collective Quantitative Goal (NCQG)**.

## What is the New Collective Quantitative Goal?

- The NCQG is a new annual **financial target that developed countries must meet from 2025** onward to provide climate finance to developing countries.
  - It will replace the previous commitment of [USD 100 billion per year](#) that developed nations had pledged in 2009 but failed to deliver.
- The final NCQG amount is expected to be a central point of negotiation at the **COP29 summit in Baku, Azerbaijan, in November 2024**.
  - The NCQG negotiations aim to set a higher collective amount that wealthy countries will need to mobilise annually for mitigation, adaptation, and other climate action efforts in poorer nations vulnerable to the impacts of climate change.
- Securing an adequate NCQG figure is extremely important for developing countries, as a **lack of sufficient climate finance has been a major** barrier to implementing effective climate plans and building resilience against global warming's effects.

# CLIMATE FINANCE

Climate finance refers to local, national or transnational financing—drawn from public/ private/alternative sources of financing—to support mitigation and adaptation actions against climate change.

## PRINCIPLES OF CLIMATE FINANCE

- ⌵ Polluter Pays
- ⌵ Common but Differentiated Responsibility and Respective Capability (CBDR–RC)

## Multilateral Climate Funds Coordinated by UNFCCC

- ⌵ **Global Environment Facility (GEF):** Operating entity of financial mechanism (1994)
- ⌵ **Kyoto Protocol (2001):**
  - ▶ **Adaptation Fund (AF):** Gives developing countries full ownership of adaptation projects
  - ▶ **Clean Development Mechanism (CDM):** To carry out emission-reduction projects in developing nations
- ⌵ **Green Climate Fund (GCF):** estd. - 2010 (COP 16)
  - ▶ Funds under it - **Least Developed Countries Fund (LDCF)** and **Special Climate Change Fund (SCCF)**
- ⌵ **Long-Term Climate Finance:**
  - ▶ **Cancun Agreements (2010):** Mobilize and provide scaled-up funds in short and long term
  - ▶ **Paris Agreement (2015):** Developed nations agreed to establish new collective goal of at least \$100 billion/year by 2025
- ⌵ **Loss and Damage Fund (2023) (COP27 & COP28):** Financial assistance to nations most vulnerable and impacted by effects of climate change

## Climate Investment Funds (CIFs) under World Bank

- ⌵ Clean Technology Fund
- ⌵ Strategic Climate Fund

### INDIA'S INITIATIVES REGARDING CLIMATE FINANCE

Fund	Objective
■ <b>National Adaptation Fund for Climate Change (NAFCC)</b> (2015)	■ For vulnerable Indian states
■ <b>National Clean Energy Fund</b> (2010-11)	■ Advancing clean energy (started with initial carbon tax on industrial coal use)
■ <b>National Adaptation Fund</b> (2014)	■ Bridging gap between required and available funds
■ <b>Intended Nationally Determined Contributions (INDCs)</b> (2015)	■ Nationally binding targets adopted under UNFCCC
■ <b>Climate Change Finance Unit</b> (2011)	■ Leads on global climate finance issues

## Challenges to Climate Finance

- ⌵ Gap between national needs and climate finance under NDCs
- ⌵ Least Developed Countries receive much less approved funding in per-capita terms from the multilateral climate funds
- ⌵ Slow rate of approvals
- ⌵ Failure in securing viability-gap funding



## How Much Money is Needed for Effective Climate Action?

- Global climate action faces a significant hurdle due to inadequate financing, especially in developing countries.
  - Annual climate finance flows fall far short of the promised USD 100 billion mobilisation by developed countries since 2020.
  - Even if that amount were available, it would only be a small fraction of the money needed to keep the world on the **1.5°C** pathway until 2030.
- Current assessments suggest annual financial requirements amount to several trillions of dollars.
  - A 2021 report by UN Climate Change estimated that developing countries would need about **USD 6 trillion annually until 2030** to implement their climate action plans. Updated reports are expected to raise this figure substantially.
  - The final agreement at Sharm el-Sheikh outlined that transitioning to a low-carbon economy could require USD 4-6 trillion annually until 2050.
- Tripling renewable energy capacity, as agreed in Dubai, is estimated to cost USD 30 trillion by

2030 as per the [International Renewable Energy Association \(IRENA\)](#).

- Combining these estimates suggests an annual requirement of USD 5-7 trillion, equivalent to about **5-7% of global GDP**, highlighting the escalating cost of inaction.

## Prospects for a Realistic New Annual Climate Finance Target

- Exact amounts under discussion are undisclosed to the public at present. Given past performance, the expectation that developed nations commit to significantly higher amounts is deemed unrealistic.
- **India has called for the NCQG to be at least USD 1 trillion per year**, primarily in grants and concessional finance.
  - However, it is unlikely that developed countries will commit to an amount close to the assessed requirements, given their failure to mobilise even USD 100 billion annually.
- The UN Climate Change Executive Secretary has urged developed countries to make climate finance "**bigger and better,**" **emphasising the need for "trillions, not billions"**.

## What are the Challenges Regarding Climate Finance?

- **Insufficient Funds:**
  - There is a significant gap between the **funds needed to address climate change and the actual resources available** for climate-related projects and initiatives.
  - Many developing countries and vulnerable communities have limited access to climate finance, hindering their ability to implement adaptation and mitigation measures.
  - Many organisations like the [UNFCCC](#) are currently facing severe financial challenges with a budget that is less than half funded.
- **Lack of Ambition:**
  - Developed countries have been reluctant to commit to the scale of funding necessary to address the climate crisis, particularly in **providing grants and concessional finance to developing nations**.
- **Transparency and Accountability:**
  - There is a need for transparent and inclusive processes to **monitor and measure the delivery of climate finance commitments**, ensuring that funds are distributed equitably and used effectively.
- **Ensuring Equity and Justice:**
  - The distribution and utilisation of climate finance should prioritise equity and justice, taking into account the needs and priorities of the **most vulnerable communities and marginalised groups** who are disproportionately affected by climate change.
- **Mobilising Private Finance:**
  - While public finance from developed nations is crucial, mobilising private sector investment and leveraging innovative financial instruments remain challenges in scaling up climate finance.
- **Capacity Building and Technology Transfer:**
  - Climate finance **should not only focus on monetary support** but also on **capacity building and technology transfer** to enable developing countries to effectively implement climate action and transition to low-carbon economies.
- **Debt Burdens:**
  - The climate finance requirements **add to the existing debt burdens of many developing nations**, raising concerns about their ability to access and repay loans for climate action.
- **Economic Impacts:**
  - The **global economic slowdown and competing priorities** may make it challenging for developed nations to allocate significant resources towards climate finance.

## **Prelims:**

**Q. With reference to the Agreement at the UNFCCC Meeting in Paris in 2015, which of the following statements is/are correct? (2016)**

1. The Agreement was signed by all the member countries of the UN, and it will go into effect in 2017.
2. The Agreement aims to limit the greenhouse gas emissions so that the rise in average global temperature by the end of this century does not exceed 2°C or even 1.5°C above pre-industrial levels.
3. Developed countries acknowledged their historical responsibility in global warming and committed to donate \$ 1000 billion a year from 2020 to help developing countries to cope with climate change.

**Select the correct answer using the code given below:**

- (a) 1 and 3 only
- (b) 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

**Ans: B**

## **Mains:**

**Q. Describe the major outcomes of the 26th session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). What are the commitments made by India in this conference? (2021)**

**Q. Explain the purpose of the Green Grid Initiative launched at the World Leaders Summit of the COP26 UN Climate Change Conference in Glasgow in November 2021. When was this idea first floated in the International Solar Alliance (ISA)? (2021)**

## **Bone Grafting Technology**

**Source: HT**

### **Why in News?**

Recently, the **Indian Institute of Technology (IIT) Kanpur** signed a **Memorandum of Understanding (MoU)** with **Canada based biotechnology company (Conlis Global)** for licensing of an innovative and indigenously developed technology that promotes **bone healing and regeneration**.

### **What are Nano Hydroxyapatite-based Porous Composite Scaffolds?**

#### **▪ About:**

- The **Nano Hydroxyapatite-based Porous Composite Scaffolds** are biodegradable and have **osteoinductive** and **osteopromotive** properties for bone regeneration.
- It is highly biocompatible ensuring good cell material interaction with **osteoblast cells** exhibiting a high mechanical strength and interaction between the polymer network and the solvent.

#### **▪ Characteristics:**



- It has **osteoinductive** and **osteopromotive** properties due to which it has **bone healing** and **bone growth** characteristics.
- They are highly biocompatible, resulting in good cell material interaction with **osteoblast cells** exhibiting a high mechanical strength and interaction between the polymer network and the solvent.
  - Osteoblast cells are responsible for **mineralisation of bone** during **bone formation** and **bone remodelling**.
- **Applications:**
  - It is commonly used in **orthopaedic** and **dental implants, bone graft substitutes, coatings for prosthetic devices, and tissue engineering scaffolds**.
  - Functionalized scaffolds can be used as fillers in **large-size bone defects**, without compromising the **connectivity** and **structural defects, oxygen, and blood circulation**.
  - It enhances **tissue formation, mineralization, and rapid defect healing**.

## What is Bone Grafting?

- **About:**
  - **Bone grafting** involves a **surgical technique** where transplanted bone is utilised to **repair** and **reconstruct bones** affected by **disease** or **injury**.
  - This procedure is applicable for **repairing bones** throughout the body.
  - Surgeons may harvest bone from various sources such as the **hips, legs, or ribs** for grafting purposes.
- **Objective:**
  - The primary objective of the invention is to **overcome the drawbacks** of the existing remedies.
    - Other alternatives have been associated with **infection** and **immune** related complications.
  - This technology provides the delivery of **bone active molecules, antibiotics** or any other drug for combating bone pathologies, reconstruction of irregular bone defects and for dental applications as well.
- **Functions:**
  - The technology facilitates bone regeneration in a biocompatible manner by acting as a carrier for **bone- active biomolecules**, delivering them directly to the site of an implant.
  - The material is a promising approach for reconstructing and repairing bone defects while addressing the drawbacks and complications associated with technologies that are available in the market at present.
  - The functionalized scaffolds can be used as fillers in large size bone defects, without compromising the connectivity and structural defects, oxygen and blood circulation thereby enhancing tissue formation, mineralisation, and rapid defect healing.
  - It can also be used as a **bone substitute**, overcoming autograft limitations.

## UPSC Civil Services Examination Previous Year Question (PYQ)

**Q. Which of the following diseases can be transmitted from one person to another through tattooing? (2013)**

1. Chikungunya
2. Hepatitis B
3. HIV-AIDS

**Select the correct answer using the codes given below:**

- (a) 1 only  
 (b) 2 and 3 only  
 (c) 1 and 3 only  
 (d) 1, 2 and 3

Ans: (b)

## Hepatitis B: A Public Health Concern In India

[Source: DTE](#)

### Why in News?


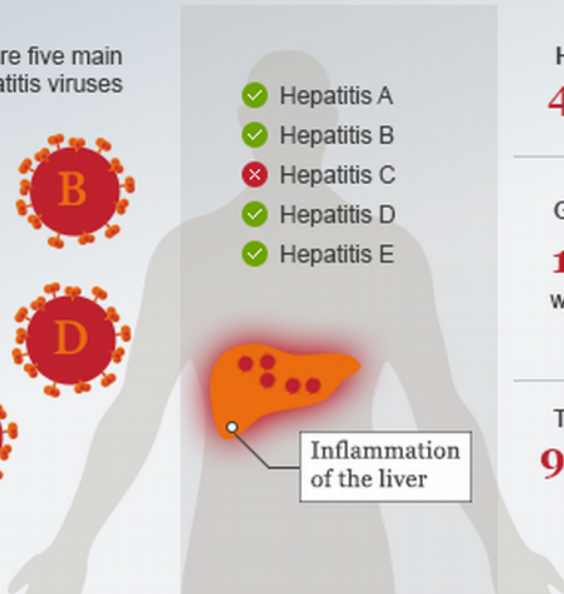


A recent study by Sir Ganga Ram Hospital, New Delhi, indicates that public awareness and knowledge regarding Hepatitis B, a potentially fatal disease leading to liver cirrhosis and cancer, is insufficient in India.

### What is Hepatitis?

#### ▪ About:

- **Hepatitis** is the **inflammation** of the **liver**, characterised by irritation or swelling of the liver cells due to various causes.
- Liver inflammation can manifest as either acute, characterised by symptoms like **jaundice**, fever, and vomiting, or chronic, lasting over six months with no apparent symptoms.

**What is hepatitis?**

The A, B, C, D and E of hepatitis	What vaccines are available for which types of hepatitis?	Estimated cases world-wide (per year)	How does the virus spread?
<p>There are five main hepatitis viruses</p> 	 <ul style="list-style-type: none"><li>✓ Hepatitis A</li><li>✓ Hepatitis B</li><li>✗ Hepatitis C</li><li>✓ Hepatitis D</li><li>✓ Hepatitis E</li></ul>	<p><b>Hepatitis B and C:</b> <b>400</b> million cases</p> <hr/> <p><b>Gradual death:</b> An estimated <b>1.4</b> million people die worldwide from hepatitis every year</p> <hr/> <p><b>Treatment:</b> <b>90%</b> of hepatitis C patients can be healed within three to six months</p>	 <p><b>Hepatitis A and E:</b> Lack of food hygiene, contaminated water and sub-standard sanitary facilities</p>  <p><b>Hepatitis B, C and D:</b> Blood, sperm and other bodily fluids</p>

#### ▪ Symptoms:

- Some individuals infected with hepatitis **may not exhibit symptoms**, but common ones include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-coloured bowel movements, joint pain, and jaundice.

#### ▪ Causes:

- Hepatitis is typically caused by hepatotropic viruses, including A, B, C, D, and E, although other viruses like the **varicella virus** can also lead to the disease.
  - **SARS-CoV-2**, the virus causing **Covid-19** may injure the liver too.

- Additional causes encompass **drug and alcohol** misuse, liver fat accumulation (**fatty liver** hepatitis), or an autoimmune response where the body produces antibodies targeting the liver (autoimmune hepatitis).

#### ▪ **Types of Hepatitis:**

- **Hepatitis A virus (HAV):**

- Hepatitis A is a liver inflammation that ranges from mild to severe, transmitted through contaminated food or water, direct contact with an infected person, and **can be prevented** with a vaccine, with most people recovering fully and gaining lifelong immunity.

- **Hepatitis B virus (HBV):**

- Hepatitis B is a **viral infection** that can cause acute or chronic liver disease, often transmitted from mother to child, through early childhood contact, or via sex or unsafe injections, but **can be prevented** by vaccines.
  - Hepatitis B vaccines are **highly efficacious** in preventing HBV infection when administered **before exposure** to HBV.

- **Hepatitis C virus (HCV):**

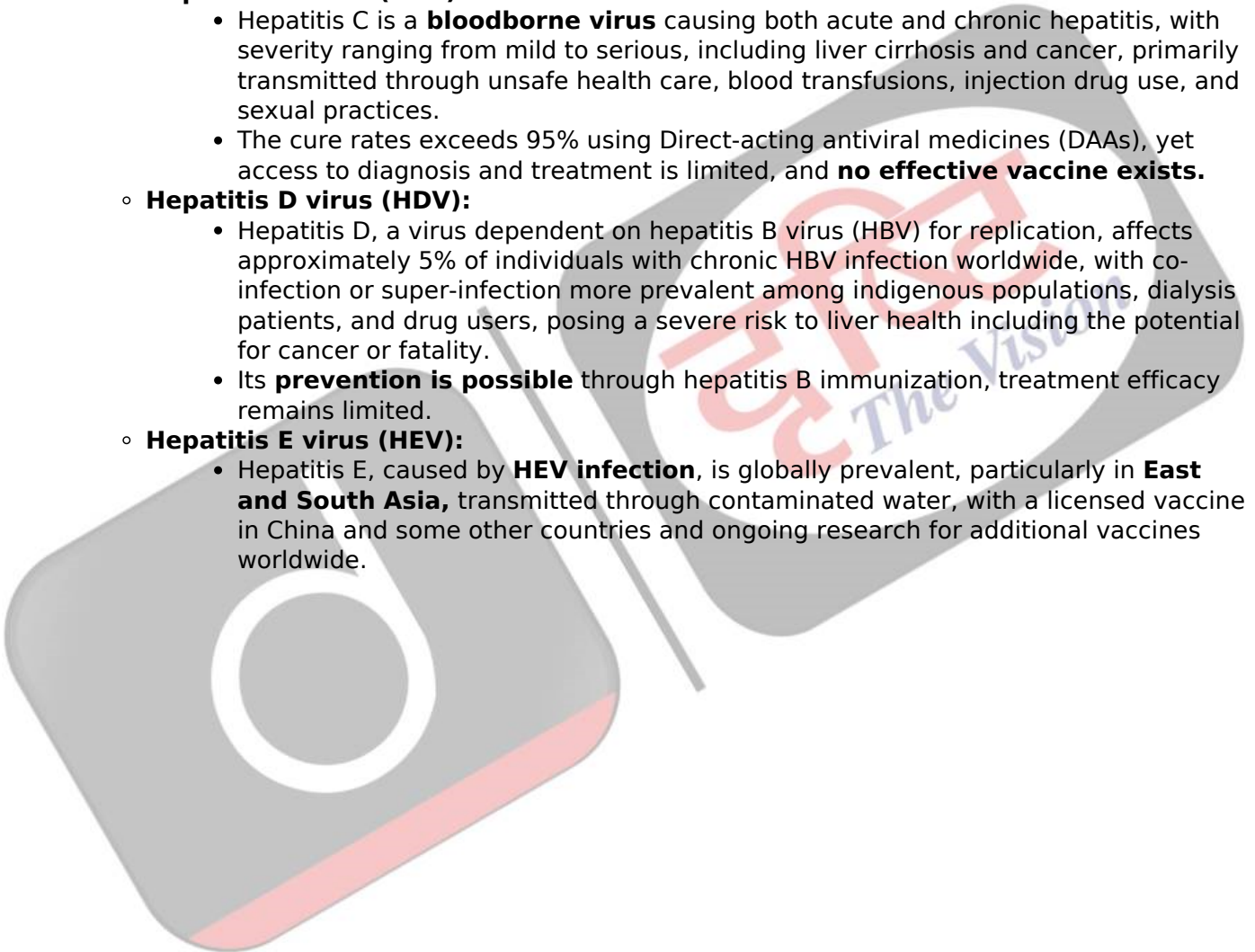
- Hepatitis C is a **bloodborne virus** causing both acute and chronic hepatitis, with severity ranging from mild to serious, including liver cirrhosis and cancer, primarily transmitted through unsafe health care, blood transfusions, injection drug use, and sexual practices.
- The cure rates exceeds 95% using Direct-acting antiviral medicines (DAAs), yet access to diagnosis and treatment is limited, and **no effective vaccine exists**.

- **Hepatitis D virus (HDV):**

- Hepatitis D, a virus dependent on hepatitis B virus (HBV) for replication, affects approximately 5% of individuals with chronic HBV infection worldwide, with co-infection or super-infection more prevalent among indigenous populations, dialysis patients, and drug users, posing a severe risk to liver health including the potential for cancer or fatality.
- Its **prevention is possible** through hepatitis B immunization, treatment efficacy remains limited.

- **Hepatitis E virus (HEV):**

- Hepatitis E, caused by **HEV infection**, is globally prevalent, particularly in **East and South Asia**, transmitted through contaminated water, with a licensed vaccine in China and some other countries and ongoing research for additional vaccines worldwide.



# Types of Hepatitis

	TRANSMISSION	PREVENTION	TREATMENT
Hepatitis A	Eating contaminated food or drinking contaminated water	<ul style="list-style-type: none"> <li>• Practicing good hygiene</li> <li>• Vaccine</li> </ul>	No treatment
Hepatitis B	Through contact with the blood or bodily fluids of an infected person	<ul style="list-style-type: none"> <li>• Practicing good hygiene</li> <li>• Vaccine</li> <li>• Blood screening</li> </ul>	<ul style="list-style-type: none"> <li>• Alpha interferon</li> <li>• Peginterferon</li> </ul>
Hepatitis C	Blood-to-blood contact	<ul style="list-style-type: none"> <li>• Practicing good hygiene</li> <li>• Avoid sharing needles, toothbrushes, razors or nail scissors</li> </ul>	Direct-acting antiviral drugs
Hepatitis D	Contact with infected blood (only occurs in people already infected with hepatitis B)	<ul style="list-style-type: none"> <li>• Hepatitis B vaccine</li> <li>• Avoid sharing needles, toothbrushes, razors or nail scissors</li> </ul>	Interferon
Hepatitis E	Eating contaminated food or drinking contaminated water	<ul style="list-style-type: none"> <li>• Practicing good hygiene</li> <li>• Avoid drinking water that has come from a potentially unsafe source</li> </ul>	No treatment

## Government Initiatives to Tackle Hepatitis:

- **National Viral Hepatitis Control Program:** The National Viral Hepatitis Control Program aims to eliminate viral hepatitis as a public health threat in the country **by 2030**.
- **India's Universal Immunization Programme (UIP):** India's Universal Immunization Programme (UIP) offers free vaccination against **eleven vaccine-preventable diseases**, including Hepatitis B, **Tuberculosis**, Diphtheria, Pertussis, Tetanus, Polio, Pneumonia, Meningitis due to Haemophilus Influenzae type b (Hib), Measles, Rubella, Japanese Encephalitis (JE), and Rotavirus diarrhoea.

## Global Initiatives:

- WHO's global hepatitis strategy
- Coalition for Global Hepatitis Elimination (CGHE)
- Global Hepatitis Programme

## What are the Recommendations Made by the Survey?

- As per the survey, only 22.7% of participants had completed the full Hepatitis B vaccination course.
  - Therefore it recommends, ensuring **accessibility** and reaching all segments of the population, especially those at high risk, is crucial for effective vaccination against HBV,

alongside increasing overall vaccination efforts.

- The survey finds that **only a quarter** of those surveyed had sufficient understanding of the disease, encompassing its transmission, impact on the liver, and the crucial role of vaccination.
  - Therefore to deal with widespread misconceptions and insufficient education on Hepatitis B the need for **targeted information campaigns** to address knowledge gaps is the way out.
  - For this, people should be educated on the necessity of **completing the entire vaccination** regimen for optimal effectiveness, as it is not uncommon for individuals to miss the final dose after receiving one or two doses.
- **It recommends educational campaigns** should target the general public, especially **women**, older individuals, those with lower education levels, and rural residents, who showed lower knowledge scores and vaccination rates in the study.
- It concludes that comprehensive strategies, which integrate **health literacy and vaccination coverage**, are crucial for achieving national and global HBV control targets.

## UPSC Civil Services Examination, Previous Year Question (PYQ)

**Q. Which one of the following statements is not correct? (2019)**

- (a) Hepatitis B virus is transmitted much like HIV.
- (b) Hepatitis B unlike Hepatitis C, does not have a vaccine.
- (c) Globally, the number of people infected with Hepatitis B and C viruses are several times more than those infected with HIV.
- (d) Some of those infected with Hepatitis B and C viruses do not show the symptoms for many years

**Ans: (b)**

**Q. Which of the following diseases can be transmitted from one person to another through tattooing? (2013)**

1. Chikungunya
2. Hepatitis B
3. HIV-AIDS

**Select the correct answer using the codes given below:**

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Ans: (b)**