



## Havana Syndrome

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### Why in News

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Recently, a report by the **National Academies of Sciences (NAS)**, USA has found **directed microwave radiation** to be the **plausible cause of the Havana syndrome**.

### Key Points

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- **Havana Syndrome:**
  - In late **2016**, USA diplomats and other employees stationed in **Havana (capital of Cuba)** reported **feeling ill after hearing strange sounds and experiencing odd physical sensations**.
  - The symptoms included **nausea, severe headaches, fatigue, dizziness, sleep problems, and hearing loss**, which have since come to be known as the **Havana Syndrome**.
  - The **more chronic problems** suffered by Havana personnel included mainly **vestibular processing and cognitive problems** as well as **insomnia and headache**.
  - While the symptoms have **resolved for some of the affected employees**, for **others**, the **effects have lingered and posed a significant obstacle** to their work and affected the normal functioning of lives.
- **About the Report:**
  - The NAS report **examined four possibilities** to explain the symptoms viz. **infection, chemicals, psychological factors and microwave energy**.
  - So far, **only this report provides the clearest and detailed estimation** of what may have transpired.
    - In **earlier attempts** by various other government agencies, scientists talked about **psychological illness** due to the stressful environment of foreign missions or **brain abnormalities** in the diplomats who had fallen ill.

- **Findings of the Report:**

- **Directed pulsed microwave radiation energy** appears to be the most plausible mechanism in explaining the cases of Havana syndrome among those that the committee considered.

By calling it “**directed**” and “**pulsed**” energy, the report leaves no room for confusion that the **victims’ exposure was targeted and not due to common sources of microwave energy.**

- The immediate symptoms that patients reported, including sensations of pain and buzzing sound, apparently **emanated from a particular direction, or occurred in a specific spot** in a room.
- It **warns about the possibility of future episodes and recommends establishing a response mechanism** for similar incidents, adding that future incidents might be more dispersed in time and place, and even more difficult to recognise quickly.
- However, the committee **cannot rule out other possible mechanisms** and considers it likely that a **multiplicity of factors** explains some cases and the differences between others.
- It also **does not mention the source and if the energy was delivered intentionally**, even though it conducted significant research on **microwave weapons.**

- **USA’s Reaction:**

- The USA has praised the NAS for undertaking the effort but also highlighted that **each possible cause remains speculative.** It also **flagged the committee’s lack of access to some information** because of potential security concerns that limit the scope of the report.
- The government also included a **provision in the new defence authorisation bill to provide long-term emergency care benefits** to the government employees affected by the syndrome.
- The **USA had accused Cuba** of carrying out “attacks”, but **Cuba denied** any knowledge of the illnesses.

## **Microwave Weapons**

- These are supposed to be a type of **direct energy weapons**, which **aim highly focused energy** in the form of sonic, laser, or microwaves, at a target.

- The high-frequency electromagnetic radiations **heat the water in the human body and cause discomfort and pain.** It works the same way as the kitchen appliance.
  - In a microwave oven, an **electron tube called a magnetron produces electromagnetic waves** (microwaves) that bounce around the metal interior of the appliance, and are absorbed by the food.
  - The **microwaves agitate the water molecules in the food**, and their **vibration produces heat** that cooks the food. **Foods with a high water content cook faster** in a microwave often than drier foods.
- **Countries with Microwave Weapons:**
  - A number of countries are thought to have developed these weapons **to target both humans and electronic systems.**
  - **China** had first put on display its microwave weapon, called **Poly WB-1**, at an air show in 2014.
  - The **USA** has also developed a prototype microwave-style weapon, which it calls the “**Active Denial System**”, which is the first non-lethal, directed-energy, counter-personnel system with an extended range greater than currently fielded non-lethal weapons.
- **Concerns:**
  - American diplomats and members of their families in Cuba and China were suspected to have been targeted using ‘microwave weapons’ (**Havana Syndrome**).
    - People exposed to high-intensity microwave pulses have **reported a clicking or buzzing sound**, as if seeming to be coming from within the head.
  - Concerns have been raised on whether they can damage the eyes, or have a carcinogenic impact in the long term.
  - It is not clear yet whether these can kill or cause lasting damage in human targets.
  - The USA holds that studies have shown that natural blink reflex, aversion response and head turn all **protect the eyes from the weapon.**

**Source: IE**