

DAILY PT POINTERS

7th October, 2024



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The status of the civil war in Sudan

What is the extent of the war? Where did the conflict between the Sudanese Armed Forces and Rapid Support Forces begin? How have ethnic tensions and rivalries played a part in the war? From where are conflicting parties sourcing their weapons and arms?

EXPLAINER

Anu Maria Joseph

The story so far:

On September 26, the Sudanese Armed Forces (SAF) launched a major offensive against the paramilitary Rapid Support Forces (RSF) in Khartoum and Bahri. Thus, the war which was quiet for a few months has gained momentum again. Eighteen months into the civil war, the UN said that more than 20,000 people have been killed. Additionally, the International Organization for Migration has recorded an estimated total of 10,890,722 internally displaced persons (IDPs) as of October 1. All ceasefire efforts and peace talks have failed so far. The

A multifaceted war

The ongoing civil war in Sudan has killed more than 20,000 people, according to the United Nations. Additionally, the International Organization for Migration has estimated a record 10,890,722 internally displaced people in Sudan



Have there been peace talks?

There were nine rounds of ceasefire efforts led predominantly by the U.S. and Saudi Arabia; all failed in their primary phase. On August 14, the latest round of U.S.-led peace talks were held in Geneva, Switzerland. But, neither of the warring parties attended. SAF boycotted the meeting, blaming the RSF for not adhering to the Jeddah Declaration 2023, including the withdrawal of forces from civilian regions. RSF also pulled out from the talks at the last moment.

The UN, the African Union, the U.S., the Intergovernmental Authority on Development, and the EU have all urged the parties to end the violence and work together to de-escalate the crisis. Egypt initiated a draft resolution on May 1 at the Arab League meeting in Cairo, calling for an "immediate and comprehensive

THE GIST

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▼ The war has become complex with the involvement of multiple actors and issues. What began as a military rivalry has now evolved through ethnic lines, involving several regional ethnic militias.

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- There were nine rounds of ceasefire efforts led predominantly by the U.S. and Saudi Arabia; all failed in their primary phase.
- There is an increasing fear that the military rivals will divide the country, leading to a plight similar to that of Libya's. Sudanese people have started to live with the war, and with much attention given to Gaza and Ukraine, the war in Sudan will continue to rage on the sidelines.

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Muizzu to meet Modi, request India's support over looming economic crisis

The Maldivian President has said he hoped that India would be ready to ease the Maldives' burden; he is expected to seek a currency swap arrangement and debt support from India; any default in repayment of the rising external debt would spiral the Maldives into a major crisis

Sahasini Haidar
NEW DELHI

Maldives President Mohamed Muizzu landed in New Delhi on Sunday for a four-day state visit to India and is expected to meet Prime Minister Narendra Modi on Monday morning with a looming economic crisis and an imminent debt repayment on his hands back home.

In an interview to an international broadcaster ahead of his visit, Mr. Muizzu said he hoped that India would be ready to "ease the Maldives' burden", and he is expected to request a currency swap arrangement and debt support during bilateral talks at Hyderabad House, after he receives a guard of honour at the Rashtrapati Bhavan.

"India is fully cognisant of our fiscal situation, and as one of our biggest development partners, will always be ready to ease our burden, find better alternatives and solutions to the challenges we face," Mr. Muizzu had told the BBC in a written interview.

In September, India announced that the State



Friendly ties: External Affairs Minister S. Jaishankar with Maldives President Mohamed Muizzu during a meeting in New Delhi on Sunday. #1

Bank of India would subscribe Maldivian government bonds of \$50 million, staving off the country's most imminent crisis, and Mr. Muizzu is expected to request Indian support in terms of currency swaps and debt waivers. He had earlier announced that China, a significant creditor, has agreed to defer loan repayments for five years.

On October 8, Maldives is due to make a \$25 million payment towards its

\$500 million sukuk (Islamic bonds) debt repayment, out of a total \$114 million still due this year, and about \$1.5 billion in the next two years. In view of the rising external debt, high debt to GDP ratio - at approximately 110% - and falling foreign exchange reserves - at about \$440 million, credit rating agencies Moody's and Fitch have both downgraded the Maldives in recent weeks, and any default on payments is likely to spiral the Maldives

into a major crisis akin to the one faced by Sri Lanka in 2022.

On Sunday, External Affairs Minister S. Jaishankar, Foreign Secretary Vikram Misri, and other officials called on Mr. Muizzu to prepare for the talks, which are expected to end with announcements of MoUs on Indian infrastructure projects, security cooperation, and bilateral cooperation in other fields.

In a social media post, Mr. Jaishankar said Mr.

Muizzu's talks with Prime Minister Modi would "give a new impetus" to India-Maldives ties.

"I am confident that this visit will pave the way to further elevating the close neighbourly relations between our two countries and strengthen the enduring friendship and cooperation between our two peoples," Maldives' newly appointed Foreign Minister, Abdulla Khaleel, also said in a post describing the meeting, without offering any specifics on the discussions.

Full turnaround

The visit by Mr. Muizzu to Delhi, his second since he attended Mr. Modi's swearing-in ceremony, marks a full turnaround in ties between the two countries from the tensions between them over the past year.

Mr. Muizzu won elections in the Maldives last year on the back of an 'India Out' campaign and insisted that India withdraw military personnel from the archipelago by May this year. Unlike leaders of other friendly countries in the neighbourhood, Mr. Muizzu did not make India his

first destination abroad, and visited Türkiye, UAE, and China instead over the past year.

Tensions also rose over remarks by Maldivian Ministers that were critical of Mr. Modi and led to an informal 'Boycott Maldives' campaign by certain tour operators, that has halved the number of Indian tourists travelling there. However, after a number of bilateral ministerial meetings, and the Modi government completing the withdrawal of military personnel, ties have warmed up and Mr. Muizzu recently sacked the Ministers involved.

While Mr. Muizzu's visit to India has been expected for some weeks, the economic situation in the Maldives, as well as a Cabinet reshuffle after the resignation of the Finance Minister, had delayed plans. Former Foreign Minister Moosa Zameer, who visited Delhi in May, has now been appointed the Finance Minister.

Mr. Muizzu and his delegation will travel to Agra and Mumbai on Tuesday and then to Bengaluru on Wednesday.

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The Hindu-Science and Tech(GSIII)-Page 18

Scientists are working on a way to detect cancer with sound waves

Biopsies are cumbersome, painful, and potentially injurious. Research has found that high-energy ultrasound can break off a small piece of cancerous tissue into droplets and release their contents into the bloodstream. The team could then test the blood for biomarkers specific to cancer.

Joel P. Joseph

Scientists have developed a new technique to detect cancer. The method uses ultrasound to turn a small part of our body's tissue into droplets that are released into the blood. These bubbles contain molecules like RNA, DNA, and proteins that allow the scientists to identify particular types of cancer.

Roger Zemp, associate professor of electrical and computer engineering at the University of Alberta, Canada, led a recent study describing such a technique. He presented his team's findings at the joint meeting of the Acoustical Society of America and the Canadian Acoustical Association at Shaw Centre in Canada on May 11.

A summary of the findings was also published in the *Journal of the Acoustical Society of America* earlier this year.

Break-off, blood, biomarker

Doctors have been using ultrasound to take pictures of internal organs. The technology converts the sound waves reflected by surfaces inside the body to an image, just the way bats use ultrasound to sense their surroundings.

This said, the goal is not to detect many cancers in a biopsy. Doctors extract a small piece of tissue or cells using a large needle from the part of the body where cancer is suspected to be present. In vitro tests can confirm if the tissue or cells are cancerous and, if so, what kind of cancer it is.

Now, Zemp and his colleagues at the university are figuring out a way to use ultrasound to perhaps someday replace biopsies, which are cumbersome, painful, and potentially injurious. They have found that high-energy ultrasound at frequencies greater than those used in ultrasound scans can break off a small piece of cancerous tissue into droplets and release their contents into the bloodstream. The team could then test the blood for biomarkers — certain biomolecules like RNA, DNA, or proteins — specific to cancer.

"Ultrasound can enhance the levels of these genetic and visible biomarkers in blood samples by over 100 times," Zemp said in a press release. "This method could allow clinicians to use blood samples to detect specific cancer types and even the mutations they contain, which are currently undetectable in blood."

He explained the technique could help clinicians avoid nearly half of all biopsies.

'New kind of readout'
In the most advanced use of the



A technician prepares to use an ultrasonogram to see that certain an image of the body's tissues using sound waves. (iStockphoto.com)

THE GIST

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Researchers were able to detect a single cancer cell circulating in the blood. Scientists have struggled to spot these cells because they're small in number. Some tests can detect them but they are extremely expensive.

Ultrasound-aided detection using blood samples is important because of its simplicity. The main advantage is its non-invasiveness, which will prevent patient discomfort.

detected the presence of a single cancer cell circulating in the blood. When cancer progresses and spreads, cancer cells move to parts of the body other than their original site via the blood. But scientists and clinicians have struggled to spot these cells in the blood because they're very small in number. A few tests are still sensitive enough to detect them, but they're expensive. For example, the "CellSearch" test costs \$10,000 (\$8,400).

Zemp & co. were able to detect a cancer cell in the blood samples of a prostate cancer patient using their technique. The team passed ultrasound waves through blood samples isolated from the cancer patients. The waves shredded the circulating cancer cells and released the biomarkers they contained into the blood. The team looked for and confirmed the presence of these biomarkers. Zemp estimated this version of the test would cost a hundred times less, around \$100,000 to \$400,000.

The researchers are now trying to expand their findings to other types of cancer, particularly breast cancer and melanoma.

"We hope our ultrasound technologies will benefit patients by providing clinicians a new kind of molecular readout of cells and tissues with minimal discomfort," Zemp said in the same release.

Needle: large cohorts
Himanshu Shekhar, assistant professor of electrical engineering, and Karla

Doctors use ultrasound to take pictures of internal organs. The technology converts the sound waves reflected by surfaces inside the body to an image, just the way bats use ultrasound to sense their surroundings.

Biological sciences and engineering, both at UC San Diego, led the effort and promising and considerably more advanced than previous work in this field.

"The ability to perform ultrasound-aided detection using drawn blood samples is most exciting because of the simplicity of this approach. The main advantage of this approach is its non-invasiveness, which will prevent patient discomfort," Shekhar said.

Marcado-Shekhar said the approach could be expanded to monitoring cancer progression and treatment response. However, she cautioned that more studies in a large cohort of patients would be required before doctors start using this tool in the clinic.

Clinical trials with large cohorts of patients with different types of cancer and healthy people across different ethnic groups and geographies are important to ensure the technique can produce accurate results for different cancer types and prove that it's sensitive to their varying biomarker thresholds.

Brian Tsymba, a research assistant professor of public policy, and Karla

and public health sciences, both at the University of Southern California, underscored this point in an article published by the US National Academies Press in May 2022. "Lack of representative studies on screening for cancer or cardiometabolic disease may lead to recommendations that fail to consider earlier ages or lower biomarker thresholds to start screening that might be warranted in some populations."

About five years
There has been a push of late for more accessible and affordable cancer screening methods.

The U.S. National Cancer Institute recently launched its Cancer Screening Research Network. In 2025, the network will start a pilot study to evaluate a battery of screening tests to spot cancer early and accurately with a cohort of 24,000 people.

The study is expected to be completed in four years.

The network may later support similar trials for screening methods developed by individual research groups, potentially including the ultrasound-based one.

"I'm optimistic that more studies are favourable, the researchers will likely pursue regulatory approval in collaboration with industry partners, and subsequently, this technique could be available commercially in about five years," Marcado-Shekhar said.

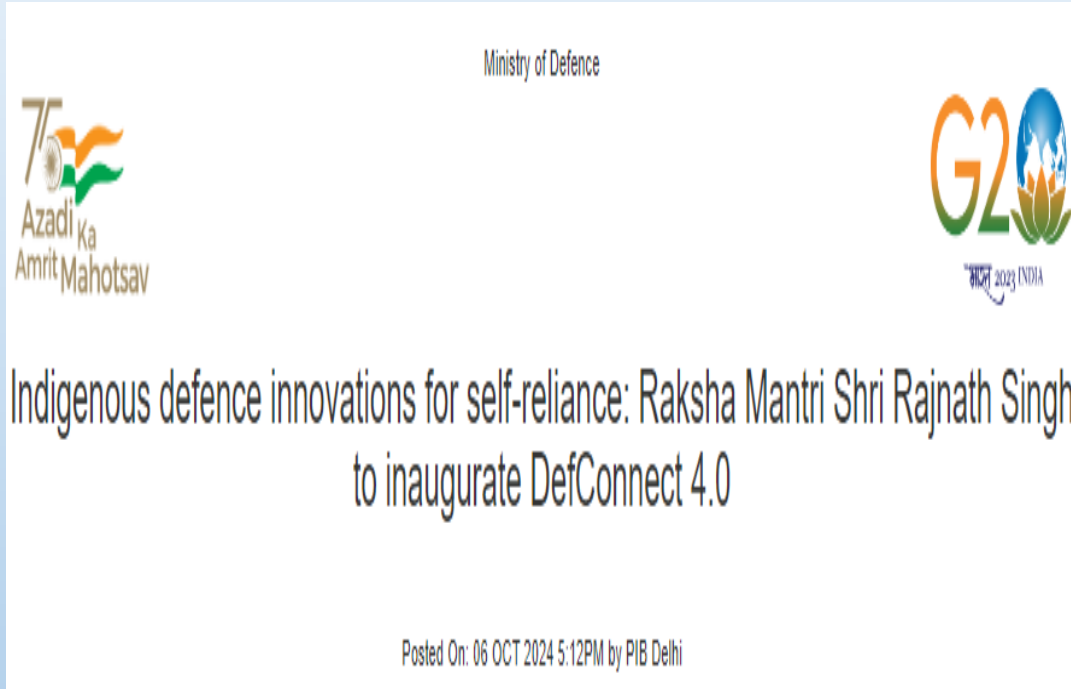
Joel P. Joseph is a freelance science journalist and researcher.

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HEADLINES OF THE DAY



PIB –GS 3(Defense)



- Raksha Mantri Shri Rajnath Singh will, on October 07, 2024, inaugurate DefConnect 4.0 at Manekshaw Centre, Delhi Cantt, a significant step towards advancing indigenous innovation and celebrating the growing defence ecosystem of the country. The event is being organised by Innovations for Defence Excellence - Defence Innovation Organisation (iDEX-DIO), under Department of Defence Production, Ministry of Defence.
- DefConnect 4.0 marks a milestone in India's defence innovation journey, bringing together the Armed Forces, Defence Public Sector Undertakings (DPSUs), industry leaders, innovators, start-ups and MSMEs, academia, incubators, investors and policymakers.

HEADLINES OF THE DAY

PIB –Governance(GSII)



- The Prime Minister, Shri Narendra Modi launched various initiatives related to the agricultural and animal husbandry sector worth around Rs 23,300 crore in Washim, Maharashtra.
- The initiatives include disbursing the 18th installment of the PM-KISAN Samman Nidhi, launching the 5th installment of NaMo Shetkari Mahasanman Nidhi Yojana, the dedication of more than 7,500 projects under the Agriculture Infrastructure Fund (AIF), 9,200 Farmer Producer Organizations, five solar parks across Maharashtra with a total capacity of 19 MW and the launch of Unified Genomic Chip for cattle and indigenous sex-sorted semen technology. Summarise .

HEADLINES OF THE DAY



PIB-Defense(GSIII)

Ministry of Defence

DRDO successfully flight-tests 4th Generation Very Short Range Air Defence System at Pokhran Field Firing Ranges in Rajasthan

Posted On: 05 OCT 2024 2:37PM by PIB Delhi

Defence Research and Development Organisation (DRDO) successfully conducted three flight-tests of the 4th Generation, technically-advanced miniaturised Very Short Range Air Defence System (VSHORADS) at the Pokhran Field Firing Ranges in Rajasthan on October 03 & 04, 2024. The tests were carried out against high speed target, demonstrating very critical parameters of maximum range and maximum altitude interception. These development trials showcased repeatability of hit-to-kill capability of the weapon system in various target engagement scenarios covering approaching, receding and crossing modes.

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- VSHORADS is a Man Portable Air Defence System designed and developed indigenously by Research Centre Imarat (RCI) in collaboration with other DRDO laboratories and DcPPs. The three Services have been associated with the project right from the beginning and participated during the developmental trials.

HEADLINES OF THE DAY

PIB-Defense(GSIII)



Ministry of Defence

CURTAIN RAISER

MALABAR- 2024

Maritime Exercise Malabar 2024, Commencing at Visakhapatnam on 08 Oct Hosted by India, USA, Australia and Japan in Participation

Posted On: 05 OCT 2024 1:12PM by PIB Delhi

- Maritime Exercise Malabar 2024 is scheduled to take place from 08 to 18 October 2024, beginning with the Harbour Phase in Visakhapatnam, followed by the Sea Phase. Hosted by India, this year's exercise will see the participation of Australia, Japan, and the United States of America.
- Exercise Malabar, which began in 1992 as a bilateral naval drill between the United States and Indian Navy, has evolved into a key multilateral event aimed at enhancing interoperability, fostering mutual understanding, and addressing shared maritime challenges in the Indian Ocean and Indo-Pacific region.

Air-Health(GSII)

WHO Approved The First Diagnostic Test For Mpox

#Mpox



- The World Health Organization has announced that it has approved the first diagnostic test for Mpox disease. The emergency use authorisation is expected to significantly enhance diagnostic capacity in countries experiencing Mpox outbreaks, where the demand for quick and accurate testing has surged. So far, over 800 people have died from Mpox in Africa, with more than 30,000 cases reported
 - Mpox is caused by **the monkeypox virus (MPXV)**, an enveloped double-stranded DNA virus of the Orthopoxvirus genus.
- There are two genetic clades of the virus: clade I and clade II.
- **Origin : Discovered** in monkeys in Denmark (1958)
 - First human case reported in a nine-month-old boy in the Democratic Republic of the Congo (1970)
 - Initially emerged in central, east, and west Africa
- Global outbreak occurred in 2022–2023