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THE TIMES OF INDIA

Wed, 05 Aug 2020

Delhi: 20,000 tested with Israeli techs that can give result in 30 minutes

By Durgesh Nandan Jha

New Delhi: The trials for validating rapid test kits for Covid-19 developed in Israel reached a milestone on Tuesday with nearly 20,000 people trying them out at six locations across the city.

These included Lady Hardinge Medical College, Ram Manohar Lohia (RML), Lok Nayak, Sir Ganga Ram and Akash Super Specialty hospitals, in addition to a facility run by Defence Research and Development Organisation (DRDO).

Commander Yaniv Meirman from Directorate of Defense Research and Development (DDRD), Israeli ministry of Defence, told TOI that the results were being analysed.

The four technologies being tested include artificial intelligence to identify changes in a patient's voice, breath analyser test that requires a patient to blow into a tube and it detects the virus using terra-hertz waves, isothermal testing that enables identification of the novel coronavirus in saliva, and another test that detects proteins of the virus collected in a saliva sample.

Meirman said except for the voice test, which they planned to try on 10,000 volunteers, the target for trials of all other tests had been almost completed. "Our aim was to test three technologies on 5,000 volunteers each, which has been nearly achieved. Trials of the voice test are likely to be completed by the weekend," he added.

All the tests being tried under the Indo-Israel collaborative project can give results within 30 minutes. Also, the concept is such that there is no need for a laboratory set up for sample collection or processing, Meirman stated.

"Some of the tests, for example isothermal testing, can in future be done at home using a self-help kit, like a pregnancy test," Meirman said. He added that the voice test was also simple and it could be operated using a mobile phone app. "All technologies already had the proof of concept. We are now validating them on volunteers," the Israeli official added.

The plan is to come up with results of the trial in a few months, following which, depending on the success or failure of the technologies under trial, mass manufacturing and marketing to the world could be discussed. The scientists said it was possible to develop and validate such technology since the entire scientific community was involved, but time was of the essence.

Israeli Ambassador Ron Malka on Friday visited RML Hospital to witness the trials being conducted there since the past three days for rapid Covid-19 testing, a statement issued by the Israel embassy stated. Malka was accompanied by professor K Vijay Raghavan, the principal scientific advisor to Prime Minister Narendra Modi.

Malka said, "If even one of these tests is successful in detecting the virus in less than half a minute, it will be the biggest breakthrough in Covid-19 identification that the world has been waiting for. By combining advanced Israeli and Indian technology and India's manufacturing prowess, we can find a way to resume our lives and exist alongside the virus till a vaccine is developed."

NEW TESTING TECHNOLOGIES

VOICE TEST

Analyses the recording of a human voice and aims to identify changes in the patient's voice and/or deterioration in the condition of his/her respiratory system



BREATHALYSER TEST

Detection based on terahertz waves. As part of an R&D programme, officials developed a system of detecting the virus using THZ waves. The patient must breathe into a sterile sampling kit, after which his/her sample is analysed using artificial intelligence



ISOTHERMAL TESTING | This is a biochemical testing method that enables the detection of the virus in a saliva sample. An inexpensive sample kit has been developed, which detects the presence of the virus with the help of a chemical reaction that takes place once the content is heated at about 60 degrees Celsius. The kit is suitable for at-home use, produces a result within 30 minutes



TESTING USING POLYAMINO ACIDS

This is a biochemical method that enables the detection of coronavirus proteins collected in a saliva sample. Using the appropriate instrumentation, a sample may be analysed in several minutes



TESTING SITES

- Ram Manohar Lohia hospital
- Lady Hardinge Medical College
- Lok Nayak Hospital
- Sir Ganga Ram Hospital
- Aakash Hospital, Dwarka
- DRDO facility

The tests have been jointly developed by Israel's DDRD, India's DRDO, Council of Scientific and Industrial Research and India's principal scientific advisor, coordinated by the ministries of foreign affairs of Israel and India.

<https://timesofindia.indiatimes.com/city/delhi/20k-tested-with-israeli-techs-that-can-give-result-in-30-min/articleshow/77361038.cms>

'By liberalising FDI policy, India would surely grab the opportunity to attract global oems' Defence Minister for States Shripad Naik

“A capital Non- Lapsable fund would provide the required certainty in availability of budget for planning defence acquisitions. It is proposed that a sum of Rs 50,000-60,000 cr Non-Lapsable fund over and above normal budgetary allocations by MoF be created”

By Manish Kumar Jha

What happened in Galwan was premeditated and planned action by China, which was responsible for the sequence of events. Is it time to declare our position clear in reference China?

The conduct of the Indian Army, along the Northern Borders, is guided by four Protocols signed between the two countries in 1993, 1996, 2005 and 2013. Thus, the 3,488-km Line of Actual Control (LAC) has been managed in accordance to the four Protocols. This has been possible as both the countries have been restricting their activities in the area of differing perception.



On 5 May 2020, the Chinese side escalated the situation in Galwan area, where there is no differing perception of LAC. On being stopped for doing infrastructure development on own side, the faceoff turned violent. The de-escalation process is on. Engagement and dialogue at military and diplomatic level is continuing to arrive at mutually acceptable consensus.

The Defence Budget is messed up with expenditure of pensions or salaries of armed forces and civilians, pensions. The Standing Committee on Defence (2018) had recommended that the Ministry of Defence (MOD) should be allocated a fixed budget of about 3 per cent of GOP to ensure adequate preparedness of the armed forces. Are we undertaking such budgetary reforms?

The total Defence Budget (including miscellaneous and pensions) is Rs 4,71,378 crore for the year 2020-21, which is 15.49 per cent of the total Central government expenditure and 2.1 per cent of GOP for the year 2020-21. Also, the Capital Budget of the Ministry of Defence for 2019-20 is approximately 28.71 per cent of the total capital expenditure of the Central government expenditure. It may not be always appropriate to link defence spending in terms of national economic output. If the economy grows at a faster rate, spending decreases as a percentage of GOP. But it doesn't mean that the level of spending has fallen, or has even become inadequate. Looking at the spending as a percentage of GOP, thus, creates an illusion of declined spending by ignoring the size of economy.

What is the likely impact of budget cuts due to the pandemic on the defence production industry of the country?

As on date there is no budget cut of the Ministry of Defence. However, there has been some restriction on expenditure during the first quarter of 2020-21.

There is a new provision for separate budget for defence procurement. How will it be structured and what are finer elements of such budgetary allocation?

(a) The Fifteenth Finance Commission (XVFC) has been given additional terms of reference to identify mechanisms for funding the defence and internal security. One of the proposals under consideration by the XVFC pertains to creation of a Capital Revolving Non-Lapsable Fund. The Commission has constituted an expert group comprising reps of MoD and Ministry of Finance (MoF) to consider detailed modalities, implementation plan and utilisation of the Capital Revolving Non-Lapsable Fund.

(b) Creation of the Capital Revolving Non-Lapsable Fund. A capital Non- Lapsable fund would provide the required certainty in availability of budget for planning defence acquisitions. It is proposed that a sum of Rs 50,000-60,000 crore Non-Lapsable fund over and above normal budgetary allocations by MoF be created. The source of the fund would be receipts from monetisation of defence land, disinvestment proceeds of PSUs, savings from internal reforms with equal top-up as incentive and certain percentage of Finance Commission grants. The fund will be recouped annually and any surplus collections would be deposited in the Consolidated Fund of India. Expenditure incurred towards services offered to the states for Humanitarian Assistance and Disaster Relief (HADR), public good as well as to the UN could be reimbursed into this fund.

Covid-19 has severely impacted the economy. How are we prioritising our critical acquisition for the Armed Forces? What are the major platforms and weapons being acquired for the forces?

(a) Defence of the Nation will always be given the highest priority and necessary funds will be available to our brave soldiers to do their task. All this is being done while ensuring that maximum possible defence procurement is done through indigenous sources, especially the MSME

(b) In the last few months the government has sanctioned the purchase of 83 Tejas fighters, 21 MiG-29, 12 Su-30 MKI aircraft, aerial fuses, long range land attack cruise missile, air-to-air missiles, Pinaka rocket ammunition, Light Machine Guns, Thermal imaging sights, communication equipments and many more.

(c) All the three forces have been delegated powers to procure critical items in quick time.

(d) As you are aware the Covid-19 has impacted the entire world including the manufacturers of some of our weapons. The delivery and payment schedules are accordingly being adjusted to remain within the fund allocation.

What is status of 114 multirole fighter project for the Indian Air Force? While we talk of building a next generation aerospace ecosystem through such mega project, the key capability gap of engine is missing? Does the project embrace such TOTs along?

Development of an indigenous fighter jet engine is a priority area for strategic autonomy. Development of indigenous jet engine through Kaveri programme has produced a good amount of know-how and industrial ecosystem in the country. Currently we are working on a programme to develop Advanced Medium Combat Aircraft (AMCA). It requires an advanced 110 kN thrust class engine, which will be developed in collaboration with aero engine houses, involving academia, industry and Defence PSUs.

FDI to 74% is step up in defence but still does not attract meaningful investment? Could you elaborate on potential and also the investment in Defence corridors so far?

With the revised policy of foreign direct investment (FDI) up to 74% through automatic route, we expect that foreign defence OEMs will be willing to set up their manufacturing units in the country, as they may now have better control over the company and may feel comfort in deploying their technologies and set up manufacturing facilities within our country. This will help in bridging the critical technology gaps in defence manufacturing ecosystem in our country. Moreover,

keeping in view the geo political scenario post Covid-19, many of the foreign companies engaged in the defence sector may like to move to or make investments in countries which may be more conducive for their operations. By liberalising its FDI policy, India would surely grab this opportunity to attract global original equipment manufacturers (OEM) in the defence sector to shift their manufacturing facilities to India and expand our presence in international supply chains.

As far as investments in Tamil Nadu and Uttar Pradesh are concerned, so far, investments of over Rs 4,000 crore have been announced in Uttar Pradesh Defence Industrial Corridor and investments of over Rs 3,000 crore have been announced in Tamil Nadu Defence Industrial Corridor. The Ministry is regularly monitoring the progress of investments in these corridors

There were cost issues for the 670,000 Kalashnikov AK203 rifles under the Indo-Russian joint venture in Amethi. When do we expect the plant to start rolling?

Committees formed under the Defence Procurement Procedure are currently examining the cost estimates submitted by the joint venture, Indo Russian Rifles. The process is likely to be concluded by this month end. The production of rifles at Korwa will commence this year.

Army has been raising the issue of sub-par quality products produced by OFB that is leading to a higher number of accidents. What are the steps the government is taking to ensure that OFB products match the standard set by the forces?

The government is keeping a track on “Transformation of Ammunition and Explosive Manufacturing in Ordnance Factories”. In this regard, the Ordnance Factory Board (OFB) has developed a Customer Complaint Monitoring System (CCMS), where factories resolve complaints of the user units and resolution is certified by QAG (an independent Quality Audit Group). Special drive was initiated by OFB to resolve the long pending complaints and take measures to avoid occurrence in future, which helped reduction of pendency of complaints to a great extent.

The Finance Minister also mentioned that barring strategic sectors all PSUs will be disinvested. Are there plans to divest from any of the DPSUs?

Disinvestment of PSUs including Defence PSUs is an ongoing process, which is carried out by Department of Investment and Public Asset Management (DIPAM), MoF as per its Annual targets and plans.

<http://www.businessworld.in/article/-By-Liberalising-FDI-Policy-India-Would-Surely-Grab-The-Opportunity-To-Attract-Global-Oems-Defence-Minister-for-States-Shripad-Naik/05-08-2020-305077/>

THE TIMES OF INDIA

Wed, 05 Aug 2020

Yet another defence indigenisation policy does not address binding constraints

The defence ministry yesterday unveiled a draft defence production and export promotion policy. Among the proposed aims is \$5 billion export of arms by 2025. This is a laudable goal. But it needs to be placed in perspective. Indigenisation of defence production has been India's aim since 1947. In keeping with this aim, a mere two years ago the government announced a similar draft policy. Given that we are back to releasing yet another draft, it may be time to take a deeper look at the binding constraints to realise the goal of indigenisation.

Large parts of defence production are characterised by features that are not common to markets for most other products. The buyers are limited and orders are often customised, thereby making for long gaps between orders and delivery. For example, a small part of the Rafale aircraft order arrived last week around four years after it was placed. The full delivery will be completed towards the end of the next year.

Given the unique nature of the market, the government needs to have a clear road map on what it wants and simultaneously stabilise funding for defence acquisition. These are the pre-conditions

to attract manufacturing investment from top end arms companies in the world. Unless that happens, defence procurement will be characterised by emergency purchases and frustration with the lackluster performances of DRDO labs and defence PSUs.

<https://timesofindia.indiatimes.com/blogs/toi-editorials/yet-another-defence-indigenisation-policy-does-not-address-binding-constraints/>



Wed, 05 Aug 2020

Opinion | Self-reliance in defence is a national imperative

India's new policy for the domestic production of weaponry aims for the sky, as it should, but much would need to change if these ambitions are not to fall by the wayside yet again

A sense of déjà vu attends every declaration of our intent to develop arms for the country's defence, but this time may be different. China has adopted a stance of open belligerence towards India, making war preparedness a top priority, and Prime Minister Narendra Modi has outlined a national vision of self-reliance, making observers who thought of it only as rhetoric think again. It is thus no surprise that the draft Defence Production and Export Promotion Policy 2020 unveiled on Monday is perhaps India's most ambitious ever. It aims for domestic output worth ₹ 1.75 trillion of aerospace and defence goods and services by 2025, with exports raking in ₹ 35,000 crore. The document itself expects to guide us to that goal, with various strategic initiatives that would aid the indigenous development of modern weaponry, from hypersonic missiles and ace sensors to stealth submarines and fly-by-wire fighter jets. In this, it adheres to the maxim that the only muscle that can reliably be flexed is one's own. Indeed, any nation that expects a say in global affairs must have such capabilities. While nuclear weapons have got India into the big power league, the rest of the country's armoury does little justice to that stature. We need rapid upgradation, and for that, our revised policy must come good.

As of now, self-reliance is a distant goal. Just over a month ago, after hostilities with China broke out in Ladakh, defence minister Rajnath Singh had to place an emergency order for 21 MiG-29 jets with Russia. This was done it seems to meet an Air Force shortfall that the local production of Hindustan Aeronautics Ltd's Tejas has failed to address. If India's dependence on foreign suppliers of armaments has proven so hard to shake off all these decades, it was not for lack of trying. Our Defence Research and Development Organisation (DRDO) exists for this very purpose, and its scientists claim success in several projects, including the Tejas design. But decisions on procurements for our armed forces are made through a complex process—involving service chiefs, technocrats and politicians—that ends up favouring foreign purchases. Not only is this convenient, as off-the-shelf wares are readily available abroad, it seems hard for any big-budget order to escape an intricate web of hidden incentives that push the money overseas, often for some of it to sneak back in. The finer details of defence deals are usually confidential, after all, and the payments huge. By one estimate, India was the world's third largest military spender in 2019, with a bill of over \$71 billion, after the US and China.

Domestic production can save a fortune. So far, efforts to get our private sector into the act have not fared too well, despite all our schemes to attract them. Long drawn out acquisition processes may partly be to blame for this. Companies are unlikely to invest in product development and production without an assurance of a ready market, and by the time their prototypes are tested and approved for induction by our forces, they risk being outmoded by advances made abroad. Yet, a new start needs to be made. In the US, spin-offs from defence research have been behind many technological innovations of everyday utility. If a big push for "made in India" defence systems

calls an entire ecosystem of experiments, ideas and technical wizardry into being, it could help our economy leap ahead too.

<https://www.livemint.com/opinion/columns/self-reliance-in-defence-is-a-national-imperative-11596552641886.html>

The Tribune

Wed, 05 Aug 2020

Army asks private firms to meet its ammunition requirements for next 10 years

The annual requirement varies from a few dozen rounds for systems like SMERCH rockets to about 70 lakh 7.62 mm bullets

By Vijay Mohan

Chandigarh: The Army has asked private industries to meet the annual requirement for different types of ammunition, including rifle bullets and artillery rockets, for the next 10 years. The move, however, comes with a rider that interested manufacturers will not receive any financial support for their venture.

In a series of requests for information (RFI) issued on Tuesday, the Master General of Ordnance's Branch at Army Headquarters has sought to identify prospective manufacturers for participating in the indigenous manufacture of ammunition.

The types of ammunition to be manufactured include rockets for the 300mm SMERCH and 122 mm BM21 systems, 90 mm shoulder-fired rocket launcher, 155 mm, 40 mm and 20 mm rounds for artillery and air defence guns as well as 7.62 mm and 9 mm rounds for different rifles and carbine.

The annual requirement projected to be sourced from the private sector varies from a few dozen rounds for systems like SMERCH rockets to about 70 lakh 7.62 mm bullets.

While inviting private firms for manufacturing ammunition, the Army has also made it clear that the government will neither provide any special concessions nor any funding or investment to facilitate setting up requisite infrastructure by participating firms.

The manufacturers will also be responsible to obtain necessary clearances under the Arms Act from the Ministry of Home Affairs, manufacturing licenses from the Department of Industrial Policy and Promotion as well as any other permissions necessary for the manufacture of ammunition in India.

Each type of ammunition has various variants or type of warhead to be used for different purposes. The Russian-origin SMERCH rockets, for example, can be equipped with cluster warhead, fuel-air explosive warhead and a high explosive fragmentation warhead. Similarly, the 7.62 mm rounds are for use in assault rifles and different types of sniper rifles.

The army has approached the private industry earlier for indigenous manufacture of ammunition. While some private manufacturers are supplying certain types of ammunition, the bulk of the indigenous supply comes from the state-run Ordnance Factory Board. A large quantity, especially that of critical and specialized ammunition, continue to be imported.

The shift towards the private industry to meet defence requirements is part of the government's efforts to facilitate the development of indigenous capacity, reduce import dependence and with the long-term objective of building capacity within the industry as a robust alternative source of



The annual requirement projected to be sourced from the private sector varies from a few dozen rounds for systems like SMERCH rockets to about 70 lakh 7.62 mm bullets.

ammunition. The government has approved manufacturing of eight selected ammunition for Indian Army by the Indian Industry.

In 2017, the government had initially identified eight types of ammunition that could be produced by the private sector. The armed forces are also identifying weapons and equipment that will be placed on the 'negative list' to curtail their imports and switch their procurement to indigenous sources. Later, the government also allowed domestic private companies to tie up with foreign firms that had been banned for corrupt practices to manufacture ammunition.

<https://www.tribuneindia.com/news/nation/army-asks-private-firms-to-meet-its-ammunition-requirements-for-next-10-years-122016>



Wed, 05 Aug 2020

Top Indian military and strategic brass review situation in eastern Ladakh

New Delhi: India's top military and strategic brass on Tuesday reviewed the overall situation in eastern Ladakh amid indications that the latest round of talks between senior military commanders of Indian and Chinese armies on the next phase of disengagement of troops may not have produced encouraging results, people familiar with the developments said.

They said India will maintain a high-level of alertness in all the sensitive areas along the Line of Actual Control(LAC), and that the Army has started preparations to maintain its current strength of troops and heavy weaponry in eastern Ladakh during the winter months.

With China showing reluctance to disengage its troops from areas like Pangong Tso and Depsang, Defence Minister Rajnath Singh, External Affairs Minister S Jaishankar, National Security Advisor Ajit Doval and Army Chief Gen MM Naravane reviewed various aspects of the three month-old border standoff.

A number of other officials were part of the meeting of the China Study Group which also includes Foreign Secretary Harsh Vardhan Shringla and Defence Secretary Ajay Kumar.

It is learnt that Gen. Naravane apprised the meeting about deployment of troops and necessary arrangements that will be required for stationing the soldiers in the high-altitude region during the harsh winter months when the temperature goes down below minus 20 degree celsius.

"There is no question of lowering our guard at all," a person aware of the deliberations at the meeting said without elaborating.

At the fifth round of military talks on Sunday, the Indian army categorically conveyed to China's PLA that it will not compromise on India's territorial integrity, and that the disengagement of troops from Pangong Tso and a few other friction points in eastern Ladakh should be completed at the earliest.

The Indian delegation also very clearly and firmly communicated to the Chinese side that restoration of status quo ante in all areas of eastern Ladakh was key for overall ties between the two countries, and that Beijing must ensure complete disengagement of its troops from the remaining friction points, sources said.

They said there was no option for the Chinese military but to disengage from the friction points as demanded by India. "We are ready for a long haul," said an official on the condition of anonymity.

There have been indications that the negotiations may not have produced very encouraging results, and that both sides will hold more talks to resolve the border row, they said.

Chinese Foreign Ministry Spokesman Wang Wenbin, meanwhile, said the two sides should always place the boundary issue in an "appropriate position" in bilateral relations, and avoid differences escalating into disputes.

Wang made this remark at a media briefing in Beijing when asked to comment on Minister Jaishankar's comments in a recent interview to a leading English daily in India that the state of the India-China border and the future of the ties between the two countries cannot be separated. The question was posed by a representative of the Chinese official media.

The Chinese army has pulled back from Galwan Valley and certain other areas but the withdrawal of troops has not moved forward from the Finger Four and Eight in Pangong Tso as demanded by India. The mountain spurs in the area are referred to as Fingers. China also has not completed withdrawal of troops from Gogra areas.

The focus of the Sunday talks was on finalising the modalities for further de-escalation, and disengagement of troops from various friction points, sources said.

The Indian delegation was led by Lt Gen Harinder Singh, the commander of the Leh-based 14 Corps, while the Chinese side was headed by Major General Liu Lin, commander of the South Xinjiang military region.

The previous round of Corps Commander-level talks had taken place on July 14 and it lasted for nearly 15 hours.

The Sunday military talks on the Chinese side of the LAC took place 10 days after both sides held another round of diplomatic talks on the border standoff.

The formal process of disengagement of troops began on July 6, a day after a nearly two-hour telephonic conversation between National Security Advisor Ajit Doval and Chinese Foreign Minister Wang Yi on ways to bring down tension in the area.

The first round of the Lt General talks was held on June 6 during which both sides finalised an agreement to disengage gradually from all the standoff points beginning with Galwan Valley.

However, the situation deteriorated following the Galwan Valley clashes on June 15 in which 20 Indian Army personnel were killed as the two sides significantly bolstered their deployments in most areas along the LAC.

The Chinese side also suffered casualties in the June 15 clashes but it is yet to give out the details. According to an American intelligence report, the number of casualties on the Chinese side was 35.

The second round of talks took place on June 22.

In the third round of military talks on June 30, both sides agreed on an "expeditious, phased and step wise" de-escalation as a "priority" to end the standoff.

Following the Galwan Valley incident, the government has given the armed forces "full freedom" to give a "befitting" response to any Chinese misadventure along the LAC. The Army has sent thousands of additional troops to forward locations along the border following the violent clashes.

The IAF has also moved air defence systems as well as a sizable number of its frontline combat jets and attack helicopters to several key air bases.

(Disclaimer: This story has not been edited by Outlook staff and is auto-generated from news agency feeds. Source: PTI)

<https://www.outlookindia.com/newscroll/top-indian-military-and-strategic-brass-review-situation-in-eastern-ladakh/1909202>

Wed, 05 Aug 2020

Indian Army plans for the long haul as talks with China remain unsatisfactory

As China's commitment for disengagement at the border in Eastern Ladakh remains unsatisfactory, India has directed its armed forces to prepare for a long haul, sources said on Tuesday.

The revelation came during a review meeting on Tuesday afternoon in the South Block as deliberation took place over the fifth round of Corps Commander level talks.

The members of the China Study Group along with Defence Minister Rajnath Singh and External Affairs Minister S. Jaishankar met to discuss the results of dialogue during the fifth round of Corps Commander level talks.

Sources said that Chinese disengagement plan at Pangong Lake and Depsang remains "unsatisfactory".

It was also decided that there was no question of diluting India's stand.

"Future strategies for disengagement at the border to be chalked out and till then forces have been told to plan for a long haul," said a source privy to the meeting.

It was also discussed that Beijing has started troop and material build-up in depth areas across the 3,488-km Line of Actual Control (LAC).

The fifth round of talks took place between the 14 Corps commander Lt General Harinder Singh and South Xinjiang Military District Chief Major General Liu Lin at Moldo on August 2 and it lasted for 10 hours.

India found that the Chinese side has started the build-up in three sectors of the LAC -- western (Ladakh), middle (Uttarakhand, Himachal Pradesh) and eastern (Sikkim, Arunachal).

Intelligence agencies also alerted that China has also mobilised soldiers near Uttarakhand's Lipulekh Pass, a tri-junction between India, Nepal and China situated atop the Kalapani Valley.

India had urged China to remove forces from Pangong Lake and Gogra where disengagement has not taken place.

At Pangong Lake, China has strengthened their positions between Finger-5 and 8, and India is to take up this move very strongly. The mountain spurs jutting into the lake are referred to as Fingers in military parlance.

The People's Liberation Army (PLA) has refused to pull back eastwards from the 8-km stretch it has occupied from Finger-4 to Finger-8 by building scores of new fortifications there since early May.

The Chinese troops are also in Depsang which continues to block Indian soldiers from going to their traditional patrolling in the region.

The Depsang Plains, a table-top plateau to the north of Galwan, remains a major hotspot due to its strategic location providing access to the logistical hub and airstrip at Daulat Beg Oldie and the critical Karakoram Pass in the north.

Since the PLA troops are not moving back as per consensus, the Indian Army has kicked off the massive logistical exercise for advance winter stocking with rations, specialised clothing, prefabricated shelters, Arctic tents and other equipment to maintain.

India has deployed over 35,000 troops in Ladakh.

China is not complying with the roadmap for a complete pullback that was drawn out during the Corps Commander level meet on July 14.

Till now two rounds of deliberations have taken at Moldo (China) and two in Chushul (India).

The countries are locked in a three-month-long stand-off at multiple points, hitherto unprecedented along the border.

China had changed the status quo on the LAC at various places, moving inside the Indian territories. India has objected to it and is taking up the matter with China at all levels.

The troop disengagement happened only at patrolling point-14 in Galwan Valley, the site of the June 15 clashes, and patrolling point-15 in Hot Springs.

On June 15, as many as 20 Indian soldiers and an unknown number of Chinese soldiers were killed in a violent clash in the Galwan Valley.

<https://www.businessinsider.in/defense/news/indian-army-plans-for-the-long-haul-as-talks-with-china-remain-unsatisfactory/articleshow/77348400.cms>



Wed, 05 Aug 2020

India-China standoff: Corps Commanders talks inconclusive, Army ready for longer haul

There is an estimated presence of about 40,000 Chinese troops along with Armoury, Artillery, and other equipments

New Delhi: The fifth round of talks between the Indian and Chinese Corps Commanders did not yield any result as the Chinese side have shown no inclination to execute the disengagement of troops from the Finger area.

Top brass of security establishments met in Delhi on Tuesday for the analysis of the meeting and sources confirmed that the matter came up for discussion during the meeting.

The Chinese are not ready to move back from the Finger area, said the sources. Chinese troops although left the height of Finger 4 but remained present on the ridge.

Indian claim has been till Finger 8 but after the clash of Indian and Chinese troops in the first week of May, China moved in its troops gradually to the Hotspring Sector, Galwan Valley, and Depsang Bulge.

There is an estimated presence of about 40,000 Chinese troops along with Armoury, Artillery, and other equipments. India has also deployed its troops along with commensurate presence of Artillery, armoured and other equipments to counter the Chinese Army.

There have been five Corps Commanders meetings with the last one being July 2 and India has reiterated its position on disengagement that status quo ante to the position before Chinese moved in and adopted the standoff position.

Of the five standoff points, the Chinese moved back only from Patrolling Point 14 and 15 and it was verified. The Chinese have not honoured the agreement between the two Corps Commanders meeting and they remain present, apart from the Finger area, in Gogra-Hot Spring sector and also in Depsang.

Keeping the present situation and fast approaching winters Indian Army has got into preparations to maintain its troop presence and in case of need even beef them up at those areas of high altitude and extreme cold.

<https://www.newindianexpress.com/nation/2020/aug/05/india-china-standoff-corps-commanders-talks-inconclusive-army-ready-for-longer-haul-2179143.html>



Wed, 05 Aug 2020

Army Aviation Corps: Air observation pilots fly helicopter sorties to support ground troops with combat and utility support

Take a look at the understated yet highly elite Combat support arms of the Indian Army, the Army Aviation Corps

By Gautam Lalotra

In military parlance, when one talks about the air-power of a nation's defence forces, most of us generally draw a strong association with the Air Force of a nation. The lightning quick multi-role fighters like the Rafales, F-16s, MiGs, Sukhoi-30s; bombers like B-2s and Tu-57s, the missile-laden attack helicopters like Apaches, Kamovs and Mi-23/35s are the very first images which flash across one's mind.

While the general notion among most is that the armies around the world are tasked to protect the land frontiers of the nation with offensive and defensive both during war and peace, there also exists an element of air operations within the Army fold which often gets unnoticed and is understated.

Not as famed as the front-line infantryman, the 'Gunners' from the Artillery, the Tankman from the Armoured Corps or the 'Sappers' from the Engineers, the Air Observation Pilots (AOP) nicknamed the 'Aviators' from Aviation Corps are indeed a small yet elite arm who is a highly specialized force skilled in flying advanced military helicopters to undertake both combat as logistical based air operations.



IAF-Apache

Armies all over the world have their own distinct Aviation wing to provide battlefield support for their ground-based troops with airborne operations - combat and logistical in nature. The Army Aviation Corps is a Combat support arm of the Indian Army which provides both combat, utility as well as logistical support to the ground-based troops via airborne operations deployed in the frontiers areas along both the Line of Control (LoC) and Line of Actual Control (LAC) in the Kashmir, Ladakh and the Northeastern sectors amid the lofty Himalayan peaks.

The major roles of the Army Aviation Corps are to perform combat search and rescue (CSAR), artillery lifts, combat transportation of men and material, logistics relief, military prisoner transportation and medical evacuation (MEDEVAC) in wartime and during natural disasters.

The Army Aviation has different types of helicopters earmarked for combat, utility, and logistical roles. While the attack helicopters like HAL Rudra (Armed Variation of HAL Dhruv) are equipped with anti-aircraft missiles and rapid-fire cannons to carry out low flying aerial assaults on moving enemy armoured columns, repulse airstrikes and also provide battlefield support to the ground troops, the utility choppers like HAL Cheetah and Chetak transport both men and material to the forward bases along the borders of our nation.

The HAL Cheetah and the Chetaks choppers for over 4 decades have been the backbone of the Army Aviation fleet carrying out gazillions of sorties during peacetime. The induction of the HAL Dhruv and the likely commissioning of the AH-64 Apache choppers in the near future has added an attacking dimension to aviation which for a long time was more utility-based.

Be it ice-laden highest battlefield in the Siachen Glacier, the cold and rugged desert of Ladakh, the highlands of the Himalayas in Kashmir or the dense jungles of the Northeast, the Aviators

make regular sorties to ensure timely supply of rations, clothing, and medicines for the sustenance of armed forces personnel against the vagaries of nature.

The Army Aviation has seen an extensive role in combat operations in different types of terrain and warfare. If they carried out a one of its kind mission by transporting men and material to the 20000-foot high highest battlefield during the 1984 Siachen Conflict, they also undertook reco missions during India's peacekeeping role in the dense jungles of Sri Lanka during Operation Pawan.

The daredevil Air Observation pilots (AOP) of the Army Aviation Corps flew more than 2500 missions during the 1999 Kargil military conflict, with almost all missions flown in High Altitude areas, close to and under enemy observation and at times under hostile and effective enemy fire.

During peace, the Army Aviation renders yeoman service to the nation by undertaking relief and rescue operations work in disaster-struck areas affected by natural calamities like floods, earthquakes. They aid the disaster-affected population by airdropping basic essentials like food, medicines, and clothing.

The rapidly changing dimension of military warfare has also brought about a tectonic shift in the role of Army Aviation. From starting off as Air Observation (AOP) units which served as an extended element of Field Artillery, the Army Aviation has taken a quantum leap in shaping up as a combat arm and has a pivotal role to play in the highly air warfare oriented military landscape.

Here is a basic fact file of the Indian Army Aviation Corps

Formation - November 1, 1986

Type of Arm - Combat Support Arm

Officer Cadre - The Army **Aviation** draws its officers from all combat arms, mostly from the Artillery.

Roles - Aerial Assaults, Medical Evacuation, Artillery Lift, Rescue and Relief, Surveillance

Helicopter Fleet of Indian Army

Attack - HAL Lancer, HAL Rudra (Armed Version of HAL Dhruv)

Utility - HAL Chetak, HAL Cheetah, HAL Dhruv
The Indian Government on Feb 20, 2020 cleared a USD 930 million deal for purchasing 6 Boeing AH-64E Apache helicopters from the United States for the Indian Army.

Note: The Indian Air Force (IAF) has its own helicopter fleet and also flies some choppers which are in the command of the Army Aviation Corps

Helicopters in IAF Fleet: Apache AH-64E, Mi-17, Mi-24/35, HAL Dhruv, HAL Chetak, HAL Cheetah, CH-47 Chinook

Choppers In Naval Aviation Arm

Kamov Ka-27, Sikorsky SH-60 Seahawk, Westland Sea King, HAL Chetak

<https://news.abplive.com/news/india/army-aviation-corps-air-observation-pilots-fly-helicopter-sorties-to-support-ground-troops-with-combat-and-utility-support-1303114>

India-China standoff: American weapons for the Indian Navy on the anvil?

The DAC is expected to clear a decision to acquire ten Unmanned Aerial Vehicles or UAVs during the forthcoming meeting on August 11

By Srinjoy Chowdhury

New Delhi: As Indian and Chinese troops remain face-to-face in Ladakh, India is buying more sophisticated American weapons, this time for the Navy.

The Defence Acquisition Council or DAC, headed by the Defence Minister Rajnath Singh and including the three chiefs and the chief of defence staff is expected to clear a decision to acquire ten Unmanned Aerial Vehicles or UAVs during the forthcoming meeting on August 11.

These UAVs are likely to be the American Sea Guardian MQ-9 drone, far deadlier than any similar weapon system India currently possesses. The Sea Guardian can be in the air for about 14 hours with its complement of air-to-ground missiles and laser-guided bombs amounting to a little less than 2,000 kg. It has a range of nearly 2,000 km or about 1,000 nautical miles. Very few countries outside the USA and its NATO allies have the Sea Guardian. Being a drone, it doesn't have a pilot, but is guided from the ground.



Representative image | Photo Credit: PTI

The DAC is also expected to clear the following:

- The purchases of Super Rapid Gun Mounts. These are medium-range anti-ship and anti-aircraft guns with 76mm shells.
- The strategic partner for building the Naval Utility Helicopter. This is a deal for 111 choppers to replace the Chetak and several foreign manufacturers are in the race. It is a Rs 20,000 crore deal that has been stuck for a considerable while.
- The refit of INS Sindhughosh, a Russian-made submarine the Navy had acquired in the mid-Eighties. The 35-year old vessel, survivor of a collision with a merchant ship and a fire, will be going to Russia for the refit.

<https://www.timesnownews.com/india/article/india-china-standoff-american-weapons-for-the-indian-navy-on-the-anvil/631942>

Wed, 05 Aug 2020

Estimating India's Defence Manpower

By Laxman Kumar Behera and Vinay Kaushal

Summary:

This issue brief estimates MoD's manpower strength in the armed forces and various other defence establishments. It also estimates total defence manpower cost, and, in so doing, looks at uniformed and civilian pay and allowances. The brief argues that like other matured democracies, such as the US and the UK, India also needs to have a public version of a manpower database which could be part of its annual budgetary document. This would facilitate greater understanding and analysis of any possible manpower-related reforms in the future.

The Ministry of Defence (MoD) employs the biggest workforce among all the central government ministries. Its workforce is nearly 50 per cent larger than that of the Railways and over 90 per cent higher than that of the Home Affairs – the two most manpower-intensive ministries after the MoD.¹ Though the bulk of the MoD's workforce consists of uniformed personnel (employed in the army, navy and air force), a sizeable number of defence civilians are employed in the armed forces and various other establishments to perform a variety of functions ranging from the provision of clerical support to the design and manufacture of state-of-the-art weapon systems. Naturally, pay and pension constitute the single largest element of the MoD's expenditure.²

The MoD does not, however, provide regular updates on the number of personnel in its roll in any systematic manner. It is, therefore, logical to assume that MoD does not have a centralised database of its manpower or, if it has, it does not wish to place it in the public domain for unspecified reasons. Nevertheless, it has been estimated previously that MoD pays nearly 50,72,880 people from its annual budget and that these personnel are spread across three broad categories: uniformed personnel, defence civilian employees, and defence pensioners.³

How accurate is the abovementioned estimate and does it capture all the MoD's serving and retired personnel? This issue brief attempts to answer this question by identifying the number of personnel in different categories including those who are paid outside the MoD's budget. In so doing, it also examines total personnel cost of defence manpower, the share of uniformed and civilian personnel in total pay and allowances (P&A), and the distribution of the uniformed personnel's P&A among various budgetary heads. It is intended to sensitise policymakers about the imperative of manpower reforms, in view of several demands for rationalising defence manpower cost.

Among the influential voices, the Chief of Defence Staff (CDS), appointed recently as part of the Narendra Modi Government's higher defence management reform, has advocated containing the defence manpower cost.⁴ The CDS' view assumes greater significance considering that the Indian defence budget is increasingly being consumed by rising manpower cost, leaving very little for modernisation, upkeep of existing arms in inventory, infrastructure upgradation, and research and development (R&D).⁵

Defence Manpower Data

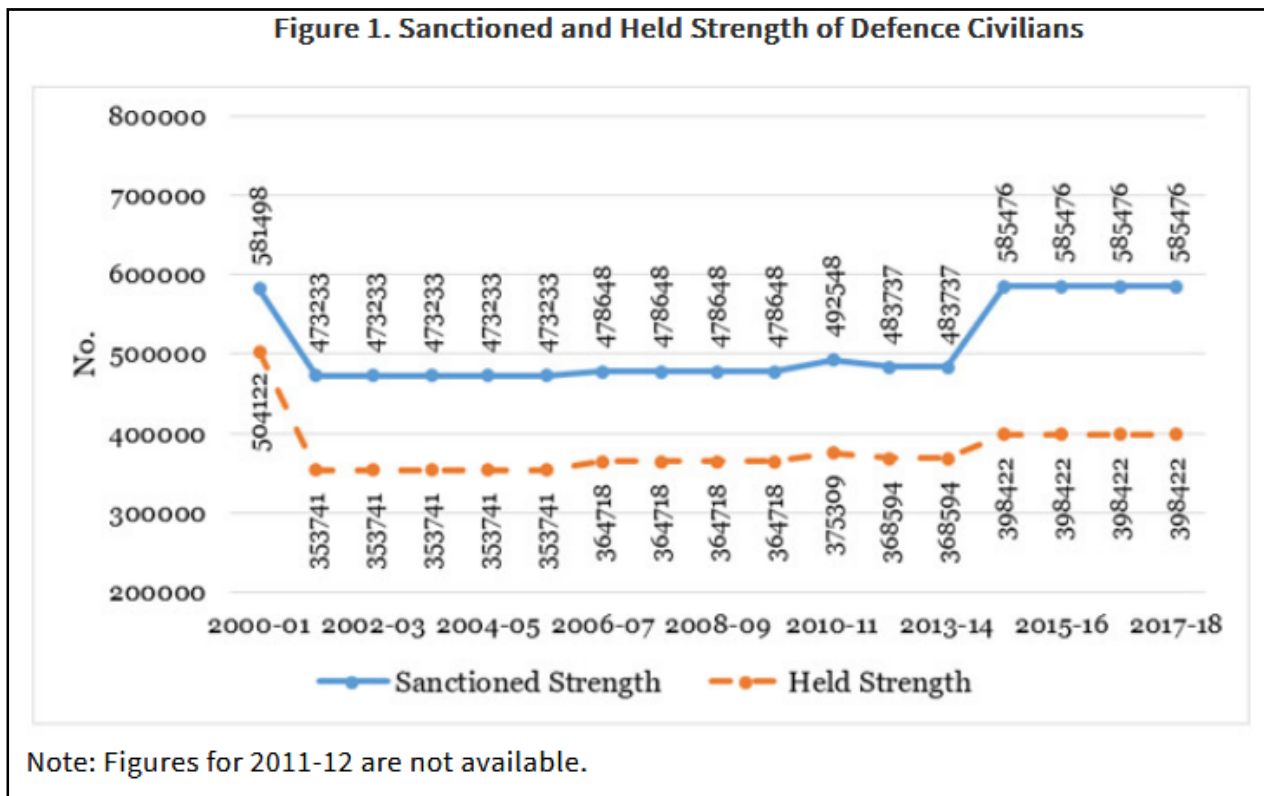
Major democracies have developed a transparent system of mapping their defence manpower in a systematic manner. For instance, the United States (US) Department of Defense (DoD) provides time-series workforce data dating back to 1940 as part of its annual budget document. It is provided in two broad categories – active duty military and civilians – with details given in a number of sub-categories (active duty military: army, navy, marine corps, air force; civilians: army, navy and marine corps, air force, space force and defence agencies).⁶ For military retirees,

time-series data from 1960 onwards are provided by DoD’s Office of the Actuary.⁷ Apart from this, the US Department of Veterans Affairs maintains a comprehensive database, providing the number and expenditure details of veterans since at least the late 1990s.⁸

The United Kingdom (UK) also provides key manpower data as part of its various official publications. The UK MoD publishes regular statistics on armed forces personnel strength, annual intake and outflows, and the strength of civilian employees.⁹ Data on pensioners are provided in two separate documents. The annual statistical document on War Pension Scheme provides the number of beneficiaries and pension expenses on account of illness/injury/death caused to service personnel between World War I and April 2005.¹⁰ For the armed forces pensioners, post-April 2005, the number and expenditure details are presented to the UK Parliament in the form of annual accounts.¹¹

It is important to note that the statistical reports published by the US and the UK are not just an exercise in itself; rather, they serve the larger interest of manpower management. In both countries, the data on active duty military personnel are used to estimate the future pension liability of the serving members.

Unlike in the US or the UK, India does not have a system of regularly reporting defence manpower in its entirety. The only exception to this is manpower figures pertaining to defence civilians. As part of its annual exercise in estimating the expenditure on P&A of central government civilian employees, the Ministry of Finance (MoF) reports authorised and held strength of various central government ministries and departments since 2000-01.¹² As of 2017-18, the latest year for which details are available, there are 3,98,422 defence civilians against a sanctioned strength of 5,85,476 – a shortage of 32 per cent. Of the total held strength of defence civilian employees, four per cent (17,160) are in Group ‘A’ service, 15 per cent (59,415) in Group ‘B’ and 81 per cent (321,847) in Group ‘C’.¹³



Source: Compiled from Annual Report on Pay and Allowances (relevant years), Department of Expenditure, Ministry of Finance, Government of India.

The MoF figures of defence civilians, however, need to be read with caution as the reported numbers exhibit an element of arbitrariness. As shown in Figure 1, both the sanctioned and held

strength of defence civilians remain constant to the last digit of the numbers for several years, raising doubts about the existence of a proper mechanism for reporting these figures.

As regards uniformed personnel, sporadic details are available in various reports of the Parliamentary Standing Committee on Defence which, from time to time, enquires about the status of manpower in the armed forces and some other defence establishments. As of 2019, the strength of uniformed personnel in the three services totals 14,38,717 against a sanctioned strength of 15,15,878, representing a shortage of five per cent. Of the total number of uniformed personnel, the army accounts for about 85 per cent, distantly followed by the air force with 10 per cent and the navy with five per cent. The officer cadre of the three forces accounts for about five per cent of the total number of uniformed personnel (see Table 1). It is, however, to be noted that even though the officer cadre is a minuscule part of the total personnel strength of the armed forces, in absolute numbers there has been a significant increase, from about 15,300 in 1957 to 37,900 in 1967 and 53,615 in 2007.¹⁴ During 2007-19, the number of officers has increased by 23 per cent.

Table 1. Held Strength of Armed Forces Uniform Personnel, 2019

Service	Category	No.	% of Total
Army	Officers	42,913	3.0
	Personnel Below Officer Rank (PBOR)	11,85,146	82.4
	Total	12,28,059	85.4
Navy	Officers	10,979	0.8
	Sailors	58,073	4.0
	Total	69,052	4.8
Air Force	Officers	12,159	0.8
	Airmen	1,29,447	9.0
	Total	1,41,606	9.8
Total Officers		66,051	4.6
Total Others		13,72,666	95.4
Total (Officers and Others)		14,38,717	100.0

Source: Compiled from "Demands for Grants (2019-20)", SCOD (2019-20), 17th Lok Sabha, 2nd Report, Lok Sabha Secretariat, December 2019.

It is important to note that the number of uniformed personnel as reported in Table 1 does not include four elements which are an integral part of the armed forces. These are: (1) officers deployed in the Army Medical Corps (AMC), Army Dental Corps (ADC) and Military Nursing Service (MNS); (2) personnel serving in the Defence Security Corps (DSC),¹⁵ (3) Non-Combatants Enrolled (NCs (E)) of the air force; and, (4) new military recruits undergoing training. These elements together account for over 1,60,000 personnel (see Table 2).

In comparison to defence civilians and uniformed personnel, information on defence pensioners is rather limited. It is only recently that the Standing Committee on Defence has reported some broad details of pensioners. Of the total number of defence pensioners (of 32,35,730), 81 per cent (26,33,947) are military retirees or their dependents and 19 per cent (6,01,783) are defence civilians. The latter category consists of personnel who have retired from organisations whose budget is accounted for by the Defence Services Estimates (DSE), an annual publication of the MoD which for long was treated as India's official defence budget. The key organisations that account for most of the defence civilian pensioners are the Ordnance Factory Board (OFB) and the Defence Research and Development Organisation (DRDO). Besides, several military organisations including the Military Engineer Services (MES), Army Ordnance Corps (AOC), Army Service Corps (ASC), naval dockyards, Base Repair Depots (BRD), Equipment Depots, army base

workshops, etc., which employ a sizeable number of civilians, also contribute to the overall number of defence civilian pensioners.

It is worthwhile mentioning here that the number of defence pensioners as reported by the Standing Committee on Defence does not capture all the retirees on the MoD's payroll. There is a sizeable number of pensioners who retired from various defence establishments but their pension is paid through the MoF's civil pension budget. As of 2020, there are about 73,700 MoD civil pensioners, a majority of whom are retired employees of the Defence Accounts Department (DAD), Borders Roads Organisation (BRO), Jammu and Kashmir Light Infantry (JKLI) and the Coast Guard (CG). Suffice it to say that the non-pensionary expenses of these organisations are paid through the MoD's civil estimate. In 2020-21, the budget for MoD civil pension amounts to Rs 5,114 crore, which includes about Rs 1,000 crore as the government's contribution towards the National Pension System (NPS) for all civilian employees paid through the DSE and the MoD's civil estimates.

The number of defence pensioners funded by both MoD and MoF adds up to nearly 33,09,430, which represents 51 per cent of the total number of central government pensioners (65,36,469).¹⁶ In terms of expenses, defence pensioners, including MoD civil pensioners, account for 51 per cent of the total central government pension budget in 2020-21.

Table 2 summarises the number of personnel in eight broad categories. The total numbers add up to 53,06,580, which is nearly 2,33,700 more than previous estimates of 50,72,880 as mentioned earlier.

Table 2. Defence Manpower

Category (Year)	No.	% of Total
Uniformed Personnel (2019)	14,38,717	27
Defence Civilians (2017-18)	3,98,422	7.5
Defence Pensioners (2018-19)	32,35,730	61
MoD Civil Pensioners (DAD, JKLI, CG, BRO) (2020)	73,700	1.4
Defence Security Corps (2020)	62,200	1.2
Armed Forces Recruits under Training (2020)	74,575	1.4
NCs (E) of Indian Air Force (2020)	11,300	0.2
Medical, Dental and Nursing Officers (2018)	11,936	0.2
Total	53,06,580	100

Source: Compiled from "Demands for Grants (2019-20)", SCOD (2019-20), 17th Lok Sabha, 2nd Report, December 2019; "Demands for Grants 2020-21", SCOD, 17th Lok Sabha, 5th Report, March 2020, p. 156; and "Annual Report on Pay and Allowances of the Central

Distribution of Defence Civilian Manpower

While Table 2 provides aggregate personnel strength across eight categories, it does not reveal the distribution of manpower, especially in respect of defence civilians, scattered both within the armed forces and other defence establishments. Table 3 tries to partly fill this gap by mapping the distribution of civilian manpower across a number of organisations.

Source: Compiled from "[Demands for Grants \(2020-21\)](#)", SCOD, 17th Lok Sabha, 5th Report, p. 153; "[Demands for Grants \(2020-21\)](#)", SCOD, 17th Lok Sabha, 8th Report, p. 15; "[Demands for Grants 2017-18](#)", SCOD, 16th Lok Sabha, 28th Report, p. 65; "Detailed Demands for Grants of Ministry of Defence for 2020-21", *Department of Expenditure*, Ministry of Finance; "[Demands for Grants 2016-17](#)", SCOD, 16th Lok Sabha, 20th Report, p. 43; "[Manpower Planning in the Indian Army: An Empirical Study of Corps of Electronics and Mechanical Engineers](#)", *Shodhganga*, Chapter 1, p. 7; "Performance Audit of the Directorate General of Quality Assurance",

Comptroller and Auditor General (CAG) of India, Report No. 18 of 2005, p. 47; [“Planning and Management of Refits of Indian Naval Ships”](#), CAG, Report No. 31 of 2013, p. 48; [“Annual Report 2018-19”](#), Ministry of Defence, p. 95; and anonymous sources.

As can be seen from Tables 2 and 3, there is a difference between the numbers of defence civilians. This is primarily due to the omission from Table 3 of several army-related organisations because of the lack of availability of information in the public domain. Some of the organisations omitted in Table 3 include the ASC, AOC, Army Postal Service, etc. The omission notwithstanding, total civilians employed within the army are estimated at around 94,000.¹⁷ Adding this to the number of civilians of the navy and air force, the total number of civilians in the three services stands at about 1,53,000.

Table 3. Distribution of Defence Civilian Manpower

Category of Manpower (Year)	Sanctioned Strength (No)	Held Strength (No.)	Shortages (%)
Civilians in air force (2020)	N.A.	21,200	---
Civilians in navy (2015-16)	46,826	37,888	19
Military Engineer Services (MES) (2017-18)	1,19,505	61,722	48
Corps of Electronics and Mechanical Engineers (EME)	18,403	14,261	23
Ordnance Factory Board (OFB) (2019-20)	1,45,503	80,524	45
Defence Research and Development Organisation (DRDO) (2018-19)	N.A.	24,732	---
Directorate General Quality Assurance (DGQA) (2005)	18,567	13,435	28
Border Roads Organisation (BRO) (2018-19)	41,600	33,587	19
Defence Accounts Department (DAD) (2018-19)	29,994	19,109	36
Defence Estate Organisation (DEO) (2018-19)	1,270	824	35
Coast Guard Organisation (2018-19)	13,842	13,842	0
Armed Forces Headquarters (AFHQ) Cadre (2020)	11,352	8,190	28
Canteen Stores Department (CSD) (2018-19)	3,668	2,348	36
Armed Forces Tribunal (2018-19)	592	374	37
Department of Defence (Including Finance Division) (2018-19)	1,590	1,144	28
Department of Defence Production (2018-19)	162	139	14
Department of Defence Research and Development (2018-19)	21	18	14
Department of Ex-Servicemen Welfare (DESW) (2018-19)	68	45	34
Total	4,52,963	3,33,382	---

Note. Information collated in the table is neither comprehensive nor up-to-date. Also, some manpower figures might be overlapping with uniformed personnel due to cross posting.

Defence Manpower Cost

The funding of the vast defence manpower comes at a significant cost. The major part of the funding comes through the MoD’s budget, while a small part is funded through the MoF. The cost is borne by the MoD/MoF in the form of P&A, pension and ration, medical, clothing, and housing benefits. In 2020-21, the total amount earmarked is more than Rs 3,08,000 crore. In terms of percentage of the total defence budget, the manpower cost amounts to 65 per cent (see Table 4).

Table 4. Defence Manpower Cost, 2020-21

Manpower Element	Amount (Rs in Crore)	% of Defence Budget [^]
P&A as Summarised in the DSE	1,53,910	32
Defence Pension (Paid through the MoD's budget)	1,33,825	28
MoD Civil Pension (Paid through the MoF's budget)	5,114	1.1
Salary of Coast Guard, DAD, BRO and JKLI* personnel	6,332	1.3
P&A of MES#	2,262	0.5
Provisions (fresh ration, dry ration, milk and milk products, etc)	4,000	0.8
Ex-Servicemen Contributory Healthy Scheme (ECHS)	3,000	0.6
Clothing**	356	0.1
Total	3,08,799	65

Note. [^]: For the purpose of estimation, defence budget is taken as the sum of MoD's budget (Rs 4,71,378 crore) and MoF's civil pension budget earmarked for MoD civil pensioners (Rs 5,114 crore); #: Figure based on 20 per cent of revenue 'Works' budget o

Source: Compiled from "Defence Services Estimates 2020-21", *Ministry of Defence; "Allocation of Budget Estimates 2020-21 under Grant No-37 Pensions"*, Central Pension Accounting Office, Ministry of Finance; "Detailed Demands for Grants of Ministry of Defence for 2020-21", *Department of Expenditure*, Ministry of Finance; and Laxman Kumar Behera & Madhulika Baniwal, "[Bang for Buck: India's Defence Expenditure in Wider Perspective](#)", *MP-IDSA Special Feature*, July 10, 2020.

Uniformed and Civilian P&A

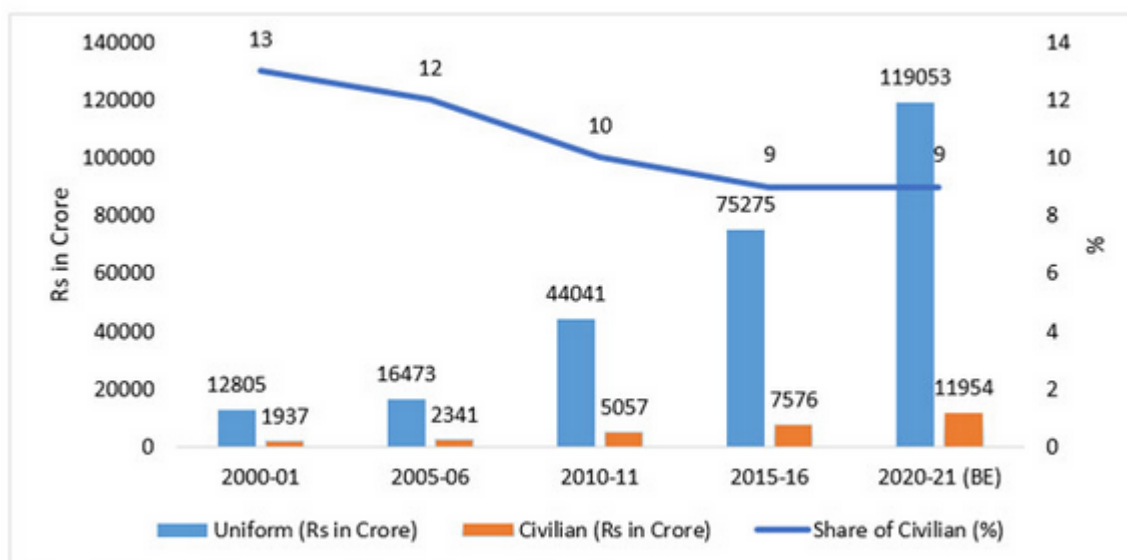
Of the total P&A earmarked in the DSE 2020-21, nearly 85 per cent (or Rs 1,31,007 crore) is accounted for by the uniformed and civilian employees of the army, navy and air force.¹⁸ In the last two decades, there has been a distinct change in the share of civilians P&A: it has declined from 13 per cent to nine per cent (see Figure 2). Among the three services, the navy, which is the most civilian intensive service, has witnessed the most drastic decline from 40 to 29 per cent, followed by the air force (from 13 to nine per cent) and the army (from 10 to seven per cent).

The fall in the share of civilian P&A is the result of a consistent increase in uniformed personnel and a sharp decline in 2001-02, near stagnation thereafter, of civilian employees (see Figure 1). Suffice it to say that the number of uniformed personnel has increased sharply during the last 50 years; from 9,58,049 in 1971 to 11,80,940 in 1995 to 14,38,717 in 2019. Between 2000-01 and 2017-18, the longest duration for which data are available, the number of defence civilians declined by 21 per cent.

The decline in the number of defence civilians does not, however, gel with the past recommendations in favour of civilianisation of several non-core functions of the armed forces. These recommendations were premised on the fact that civilians are less costly than uniformed personnel because the latter, unlike the former, are entitled to military service pay (MSP), ration and clothing allowances, and, more importantly, pension.¹⁹ Suffice it to say that the Fifth Central Pay Commission (CPC) in its report had mapped out several organisations where deployed uniformed personnel could be replaced by civilians.

Some of the organisations identified by the Commission for civilianisation include the ASC, DGQA, MES, BRO, Accounts branch of the air force, Resettlement Wing, CSD and Survey of India, among others. Further, the Commission had suggested, as a matter of governing principle, that "wherever the existing civilian-combatant ratio is 20:80 it should be raised to 50:50, where it is 70:30 to 80:20 and where the civilian component is 100 per cent, the status quo should be maintained."²⁰ Considering that the armed forces face shortages of personnel to perform key operational tasks, it is imperative for the government to civilianise the non-core functions of the armed forces and divert combatants to perform the tasks they are best at.

Figure 2. Share of Uniformed Personnel and Civilians in Armed Forces P&A



Note. Uniformed personnel include auxiliary forces.

Source: Compiled from Defence Services Estimates (relevant years), *Ministry of Defence*, Government of India.

Distribution of P&A of Uniformed Personnel

Of the total P&A of the army, navy and air force, the uniformed personnel account for about 90 per cent (or Rs 1,17,309 crore) in 2020-21.²¹ The uniformed personnel's P&A is distributed among a number of sub-budgetary heads. However, the sub-budgetary heads do not offer an easy template to estimate the crucial teeth-to-tail ratio, making it difficult to assess how much resource the government spends on personnel engaged in support services in order to support combatants. Besides, there is no commonality of sub-budgetary heads among the services.²² Among the three services, the navy has, however, a better system of capturing P&A of the uniformed personnel. Its sub-budgetary heads offer clarity as to how much the navy spends on personnel deployed in headquarters, ships/establishments, repair and maintenance organisation, DSC, besides expenses on items such as leave travel concession (LTC) and medical, among others.²³ Such a template, with suitable modifications, should be adopted by the other two services to facilitate meaningful analysis of the personnel expenditure.

Summing Up

As demonstrated above, the MoD's manpower base is significantly higher than what has otherwise been known in the public domain so far. Total defence manpower – including medical professionals, personnel deployed in the DSC, military recruits undergoing training, and MoD civil pensioners paid out of the MoF's budget – add up to 53,06,580, which is nearly 2,33,700 more than previously estimated. Total defence manpower represents 47 per cent of the central government's total salaried persons and pensioners. About 62 per cent of defence manpower, however, consists of retired personnel, a majority of whom are military pensioners and their dependents.

Such a large defence manpower base has obviously come at a significant cost, adversely affecting the modernisation of defence forces, serviceability of existing weapons and technological advancement. Rationalisation of manpower, including by way of civilianising the non-core functions of the armed forces as suggested by the Fifth Pay Commission, therefore, is key to the long-term sustainability of India's defence preparedness.

However, any manpower reform has to begin with knowing the numbers, their deployment in various organisations and the types of retirees. For this, the MoD needs to map the entire manpower, both serving and retired. This is not an unsurmountable job considering the computerisation of pay and pension records. A comprehensive and up-to-date database would facilitate an easy understanding and greater analysis of defence manpower and its costs. Like other

democracies, India may also like to maintain a detailed time-series statistics of defence manpower as part of its annual budgetary documents.

(The authors gratefully acknowledge the vital inputs provided by the various government authorities for this study. Views expressed are of the authors' and do not necessarily reflect the views of the Mahonar Parrikar IDSA or of the Government of India.)

1. As of March 2018, there were 31,80,100 regular Central Government employees in position (against a sanctioned strength of 38,66,691), of which 12,48,325 employees were in Railways and 9,48,266 in Home Affairs. In 2017-18, the MoD's personnel strength was 18,42,343, of which 14,43,921 were uniformed personnel and 3,98,422 were defence civilians. See "[Annual Report on Pay and Allowances of the Central Government Civilian Employees 2017-18](#)", Department of Expenditure, Ministry of Finance, Government of India; "[Demands for Grants 2018-19](#)", Standing Committee on Defence (SCOD) (2017-18), 17th Lok Sabha, 40th Report, Para 1.29, Lok Sabha Secretariat, March 2018.
2. See Laxman Kumar Behera, "[India's Defence Budget 2020-21](#)", MP-IDSA Issue Brief, February 04, 2020.
3. Ibid.
4. Amrita Nayak Dutta, "[Make short service lucrative, raise retirement age: CDS plan to reduce defence pensions](#)", *The Print*, April 30, 2020. For a discussion on defence pension, see Laxman Kumar Behera, Vinay Kaushal and Amit Cowshish, "[Defence Pension: A Comparative Study of India, US and UK](#)", MP-IDSA Policy Brief, April 23, 2020; and Laxman Kumar Behera and Vinay Kaushal, "[Defence Pension Reforms: Recommendations of the Past Committees and Commissions](#)", MP-IDSA Special Feature, February 28, 2020.
5. For a comprehensive review of the impact of manpower cost on other elements of India's defence expenditure, see Laxman Kumar Behera and Madhulika Baniwal, "[Bang for Buck: India's Defence Expenditure in Wider Perspective](#)", MP-IDSA Special Feature, July 10, 2020.
6. See Table 7-5 in "[National Defense Budget Estimates for FY 2021](#)", Office of the Under Secretary of Defense (Comptroller), April 2020, pp. 285-88. In FY 2021, the US DoD has a total manpower of 2.248 million, of which 64 per cent or 1.442 million are in active duty military and 36 per cent or 0.806 million are civilians.
7. As of FY 2018, the US has 20,01,343 retirees receiving retired pay. See "[Statistical Report on the Military Retirement System: Fiscal Year Ended September 30, 2018](#)", Office of the Actuary, US Department of Defence, May 2019, pp. 16-17.
8. See "[Expenditure Tables: Data for 1996-2019](#)", US Department of Veterans Affairs.
9. See "[Excel tables to UK armed forces quarterly service personnel statistics: 1 April 2020](#)", UK Ministry of Defence, June 04, 2020.
10. See "[War Pension Scheme annual statistics: 1 April 2009 to 31 March 2019](#)", UK Ministry of Defence, June 27, 2019.
11. See "[Armed Forces Pension Scheme \(Incorporating the Armed Forces Compensation Scheme\): Annual Accounts 2018-19](#)", UK House of Commons, July 2019.
12. See "[Annual Report on Pay and Allowances](#)", Department of Expenditure, Ministry of Finance, Government of India.
13. "[Annual Report on Pay and Allowances of the Central Government Civilian Employees 2017-18](#)", no. 1, p. 47.
14. "[Human Resource Planning, Shortage of Manpower, Infusion of Hi-Tech Training and Infrastructure for the Armed Forces](#)", SCOD (2008-2009), 14th Lok Sabha, 34th Report, Lok Sabha Secretariat, February 2009, pp. 9-11.
15. The personnel of the DSC are subject to Army Act and are responsible for providing security to the defence installations of the armed forces and other civilian defence establishments. See "[Defence Security Corps](#)", Indian Army, Government of India.
16. For the total number of Central Government pensioners, see "[Performance Dashboard: Central Government Pensioners as on 31.03.2019](#)", Department of Pension & Pensioners' Welfare, Ministry of Personnel, Public Grievances & Pensions, Government of India.

17. Army's civilian strength is based on extrapolation of Indian air force's 2020-21 civilian manpower number (of around 21,200) and its P&A (of Rs 1,627 crore). By applying the average P&A of an air force civilian employee to that of the army, the latter's civilian strength in 2020-21 is estimated at 94,238.
18. The remaining 15 per cent is distributed among OFB (five per cent), Rashtriya Rifles (four per cent), DRDO (three per cent), Joint Staff (two per cent), and DGQA, National Cadet Corps (NCC), Military Farms and ECHS (one per cent).
19. Since January 2004, all new entrants to the government service are covered under the NPS, a contributory pension scheme under which the employee contributes towards his/her pension with a matching contribution from the government. See "[Streamlining National Pension System](#)", Press Information Bureau, Government of India, December 10, 2018.
20. "Report of the Fifth Central Pay Commission, Vol. I", Ministry of Finance, Government of India, pp. 301-302.
21. The P&A of the uniformed personnel of the three forces are captured through the Minor Head 101 of Major Heads 2076 (Army revenue), 2077 (Navy revenue) and 2078 (Air Force revenue).
22. In the case of Army, the sub-heads include P&A of Officers, P&A of Other Ranks, P&A of Recruits, LTC and Medical Treatment. The corresponding heads of the air force are: P&A of Officers (flying, technical and non-technical), P&A of Flight Cadets (flying, technical and non-technical), P&A of airmen (technical and non-technical), P&A of NC (E), LTC and Medical Treatment.
23. In 2020-21, of the total P&A (Rs 7,428 crore) of the uniform personnel of the navy, the share of officers was 30 per cent. Total P&A of officers is distributed into a number of heads that include Establishments and Units other than Ships/Training Ships (25 per cent of total P&A of officers), Ships (other than Training Ships) (22 per cent), Naval Headquarters (13 per cent), Training Ships/Establishments (10 per cent), Repair and Material organisations (13 per cent), and others (17 per cent). Based on the navy's P&A of officers deployed at headquarters, the authors estimate that nearly 6,500 officers of the three armed forces are deployed at the service headquarters. If officers posted in the National Capital Region (NCR) are taken into consideration, the total number would be much higher.

<https://idsa.in/issuebrief/estimating-indias-defence-manpower-040820>



Wed, 05 Aug 2020

Army to choose from Tata, American Stryker and Humvee for its armoured protection vehicle requirements

Sources said during the evaluation process, the indigenous platform would certainly have preference over the foreign products in meeting the requirements of the Army

Edited By Ankita Bhandari

New Delhi: Seeking to provide highly mobile armoured protection vehicles to its soldiers in high altitude terrains like Eastern Ladakh, the Indian Army is looking to choose from three different vehicles including the indigenous Tata Wheeled Armoured Protection along with American Stryker Infantry Combat Vehicle and Humvee.

The Indian Army has a need for armoured infantry combat vehicles for quick movement of troops in the Eastern Ladakh area where the Chinese have deployed their armoured personnel carriers in large numbers. The force is looking at the three options which include the Tata WhAP and the American Stryker and Humvee, defence sources told ANI.

The options are being evaluated by the force at the moment



and a decision in this regard would be taken soon, they said. Sources said during the evaluation process, the indigenous platform would certainly have preference over the foreign products in meeting the requirements of the Army.

While the Tata vehicle is yet to enter service, the Stryker and Humvee have been part of the American defence forces for a long time now.

Tata WhAP, which has been co-developed with a DRDO laboratory, has undergone several trials in recent times including high altitude tests. The Strykers and Humvee are reportedly capable of being dropped from transport aircraft including the C-130J and the C-17s which are also operated by the Indian Air Force.

During the ongoing standoff with the Chinese in Eastern Ladakh, the Chinese troops had come to the Line of Actual Control at multiple points including Galwan Valley, Hot Springs, Gogra and Patrolling Point 15 using heavy vehicles including Armoured Personnel Carriers.

The Indian Army uses a large number of Russian-origin BMP infantry combat vehicles, which are used by the Mechanised Infantry regiments of the Indian Army in deserts, plains, and high altitude locations.

<https://zeenews.india.com/india/army-to-choose-from-tata-american-stryker-and-humvee-for-its-armoured-protection-vehicle-requirements-2300575.html>

अमर उजाला

Wed, 05 Aug 2020

लिपुलेख में भारतीय वायु सेना के विमान ने उड़ान भरकर लिया जायजा

डीडीहाट/पिथौरागढ़: लिपुलेख के निकट सीमा पर चीन की ओर से एक हजार सैनिकों की तैनाती के बाद से भारतीय सुरक्षा एजेंसियां खासी सतर्क हैं। सीमा की जमीन से ही नहीं बल्कि वायु मार्ग से भी निगरानी की जा रही है। मंगलवार को भारतीय वायुसेना के लड़ाकू विमान ने लिपुलेख बार्डर पर उड़ान भरी। इधर नेपाल सीमा पर भी कड़ी चौकसी की जा रही है।

पिछले दिनों लद्दाख से लेकर लिपुलेख तक सीमा चीन की गतिविधियों के बाद से भारतीय सुरक्षा एजेंसियां अलर्ट पर हैं। पिछले तीन माह से सीमा पर जवान लगातार गश्त कर रहे हैं। चीन की किसी भी तरह की हरकतों का सीमा पर भारत-तिब्बत पुलिस के साथ ही सेना के जवान भी पर्याप्त संख्या में तैनात किए गए हैं। इस समय भारतीय सुरक्षा बलों के जवान सीमा पर पैदल तो चौबीस घंटे गश्त कर ही रहे हैं, इसके अलावा हवा से भी सीमा की निगरानी की जा रही है।

भारतीय वायुसेना के फाइटर विमान ने मंगलवार सुबह लगभग 11.10 से 11.20 तक क्षेत्र में अपनी उपस्थिति दर्ज कराकर चीन को किसी भी तरह की हरकत का जवाब देने के लिए तैयार होने के साफ संकेत दिए हैं। सीमा पर हो रही गतिविधियों को देखते हुए भारत-चीन सीमा पर नाभीदाग से लीपुलेख के आठ किमी के हिस्से को पूरी तरह से भारतीय सुरक्षा बलों ने छावनी में बदल दिया है। चीन के साथ ही इधर नेपाल भी भारत सीमा पर अपने सैन्य बल को बढ़ा रहा है। इसको देखते हुए भारत की ओर से नेपाल सीमा पर भी चौकसी बढ़ाई गई है। हालांकि नेपाल सीमा पर पूरी तरह से शांति है।

<https://www.amarujala.com/uttarakhand/pithoragarh/indian-air-force-fighter-aircraft-flew-in-script-pithoragarh-news-hld3922305156>

Indian Army starts process to grant permanent commission to women officers

The officials said women officers who have joined the Army through the WSES and SSC are being considered for grant of the PC

New Delhi: The Indian Army has kickstarted the process to grant Permanent Commission to eligible women officers, nearly two weeks after the defence ministry approved the proposal.

Officials said the Army headquarters has invited applications by August 31 for grant of Permanent Commission (PC) to women officers recruited under Women Special Entry Scheme (WSES) and Short Service Commission (SSC).

"Consequent to the receipt of formal Government Sanction Letter for grant of PC to women officers in Indian Army, the Army headquarters is in the process of convening a special number selection board for screening women officers for grant of PC," said an Army statement.

The officials said women officers who have joined the Army through the WSES and SSC are being considered for grant of the PC.

Last month, the Ministry of Defence issued an order for grant of PC to women officers in the Army.

In a landmark judgement, the apex court in February directed that all serving women officers recruited under the short service schemes will have to be considered for PC.

Officials said 10 streams where PC of women officers are being made available include army air defence, signals, engineers, army aviation, electronics and mechanical engineers, army service corps and intelligence corps.

At present, the Army offers permanent commission to women officers in two branches -- judge advocate general (JAG) and education.

Under SSC, women officers are initially taken for a period of five years, which is extendable up to 14 years. Permanent commissioning will allow them to serve till the age of retirement.

The Army recruits women officers under SSC for streams like air defence, engineering, signals and services and they can serve up to a maximum of 14 years.

The three services have allowed permanent recruitment of women in select streams including medical, education, legal, signals, logistics and engineering.

The women officers recruited through the SSC in the IAF have the option of seeking a permanent commission in all streams except the flying branch.

The Navy has allowed the permanent commission of women in a host of departments such as logistics, naval designing, air traffic control, engineering and legal.

https://www.business-standard.com/article/current-affairs/indian-army-starts-process-to-grant-permanent-commission-to-women-officers-120080401683_1.html

भारतीय सेना में शामिल होने वाली महिला अधिकारियों के लिए जारी किए गए निर्देश

महिला अधिकारी स्पेशल एंटी स्कीम या शॉर्ट सर्विस स्कीम के माध्यम से ज्वाइन करने वाली हैं उनपर अभी विचार किया जा रहा है।

नई दिल्ली: भारतीय सेना में जो महिला अधिकारी स्पेशल एंटी स्कीम या शॉर्ट सर्विस स्कीम के माध्यम से ज्वाइन करने वाली हैं उनपर विचार किया जा रहा है। भारतीय सेना द्वारा निर्देश दिया गया कि वे अपना अप्लीकेशन फॉर्म, ऑप्शन सर्टिफिकेट और अन्य जरूरी दस्तावेज सेना के मुख्यालय में 31 अगस्त 2020 तक किसी भी हाल में जमा करें।

वहीं, दूसरी ओर अभी हाल ही भारतीय सेना में महिलाओं के स्थायी कमीशन को केंद्रीय रक्षा मंत्रालय ने आधिकारिक मंजूरी प्रदान कर दी है। सुप्रीम कोर्ट ने इस महीने केंद्र सरकार को भारतीय सेना में कार्यरत SSC महिला अधिकारियों को स्थायी कमीशन प्रदान करने के लिए एक महीने का समय दिया था।



भारतीय सेना के प्रवक्ता ने बताया था कि भारतीय सेना में महिला अधिकारियों को स्थायी कमीशन देने के लिए सरकार ने औपचारिक स्वीकृति पत्र जारी कर दिया है, जिससे महिला अधिकारियों को संगठन में बड़ी भूमिका निभाने का अधिकार मिल गया है। यह आदेश भारतीय सेना की सभी 10 स्ट्रीम में शॉर्ट सर्विस कमीशन (SSC) की महिला अधिकारियों को स्थायी कमीशन देने के लिए निर्दिष्ट करता है। जैसे ही सभी प्रभावी SSC महिला अधिकारी अपने विकल्प का प्रयोग करती हैं और अपेक्षित दस्तावेज पूरे कर लेती हैं, उनका चयन बोर्ड निर्धारित किया जाएगा।

स्थायी कमीशन से महिलाएं 20 साल तक काम कर पाएंगी। अभी तक शॉर्ट सर्विस कमीशन की वजह से महिलाएं सेना में 14 वर्ष तक की काम कर पाती थी। कुछ महिला अधिकारियों को एक्सटेंशन मिला था लेकिन उन्हें भी स्थायी कमीशन नहीं दिया गया था। इस वक्त सेना में 300 से ज्यादा महिला अधिकारी 14 साल से ज्यादा अवधि के बाद भी काम कर रही हैं। इस वक्त थल सेना में 3.89 प्रतिशत, नौसेना में 6.7 प्रतिशत और वायु सेना में 13.28 प्रतिशत महिलाएं काम कर रही हैं।

<https://www.jagran.com/news/national-instructions-issued-for-women-special-officers-joining-the-indian-army-20590268.html>

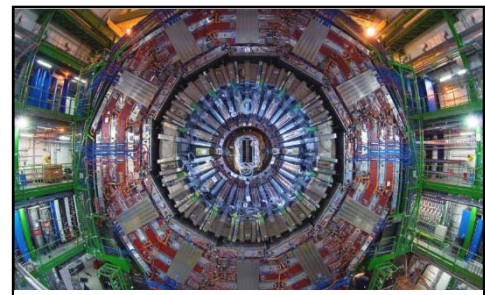


Wed, 05 Aug 2020

CERN experiments announce first indications of a rare Higgs boson process

At the 40th ICHEP conference, the ATLAS and CMS experiments announced new results which show that the Higgs boson decays into two muons. The muon is a heavier copy of the electron, one of the elementary particles that constitute the matter content of the Universe. While electrons are classified as a first-generation particle, muons belong to the second generation. The physics process of the Higgs boson decaying into muons is a rare phenomenon as only about one Higgs boson in 5000 decays into muons. These new results have pivotal importance for fundamental physics because they indicate for the first time that the Higgs boson interacts with second-generation elementary particles.

Physicists at CERN have been studying the Higgs boson since its discovery in 2012 in order to probe the properties of this very special particle. The Higgs boson, produced from proton collisions at the Large Hadron Collider, disintegrates—referred to as decay—almost instantaneously into other particles. One of the main methods of studying the Higgs boson's properties is by analysing how it decays into the various fundamental particles and the rate of disintegration.



CMS detector. Credit: CERN

CMS achieved evidence of this decay with 3 sigma, which means that the chance of seeing the Higgs boson decaying into a [muon](#) pair from statistical fluctuation is less than one in 700. ATLAS's two-sigma result means the chances are one in 40. The combination of both results would increase the significance well above 3 sigma and provides strong evidence for the Higgs boson decay to two muons.

"CMS is proud to have achieved this sensitivity to the decay of Higgs bosons to muons, and to show the first experimental evidence for this process. The Higgs boson seems to interact also with second-generation particles in agreement with the prediction of the Standard Model, a result that will be further refined with the data we expect to collect in the next run," said Roberto Carlin, spokesperson for the CMS experiment.

The Higgs boson is the quantum manifestation of the Higgs field, which gives mass to elementary particles it interacts with, via the Brout-Englert-Higgs mechanism. By measuring the rate at which the Higgs boson decays into different particles, physicists can infer the strength of their interaction with the Higgs field: the higher the rate of decay into a given particle, the stronger its interaction with the field. So far, the ATLAS and CMS experiments have observed the Higgs boson decays into different types of bosons such as W and Z, and heavier fermions such as tau leptons. The interaction with the heaviest quarks, the top and bottom, was measured in 2018. Muons are much lighter in comparison and their interaction with the Higgs field is weaker. Interactions between the Higgs boson and muons had, therefore, not previously been seen at the LHC.

"This evidence of Higgs boson decays to second-generation matter particles complements a highly successful Run 2 Higgs physics programme. The measurements of the Higgs boson's properties have reached a new stage in precision and rare decay modes can be addressed. These

achievements rely on the large LHC dataset, the outstanding efficiency and performance of the ATLAS detector and the use of novel analysis techniques," said Karl Jakobs, ATLAS spokesperson.

What makes these studies even more challenging is that, at the LHC, for every predicted Higgs boson decaying to two muons, there are thousands of muon pairs produced through other processes that mimic the expected experimental signature. The characteristic signature of the Higgs boson's decay to muons is a small excess of events that cluster near a muon-pair mass of 125 GeV, which is the mass of the Higgs boson. Isolating the Higgs boson to muon-pair interactions is no easy feat. To do so, both experiments measure the energy, momentum and angles of muon candidates from the Higgs boson's decay. In addition, the sensitivity of the analyses was improved through methods such as sophisticated background modelling strategies and other advanced techniques such as machine-learning algorithms. CMS combined four separate analyses, each optimised to categorise physics events with possible signals of a specific Higgs boson production mode. ATLAS divided their events into 20 categories that targeted specific Higgs boson production modes.

The results, which are so far consistent with the Standard Model predictions, used the full data set collected from the second run of the LHC. With more data to be recorded from the particle accelerator's next run and with the High-Luminosity LHC, the ATLAS and CMS collaborations expect to reach the sensitivity (5 sigma) needed to establish the discovery of the Higgs boson decay to two muons and constrain possible theories of physics beyond the Standard Model that would affect this decay mode of the Higgs boson.

More information: Measurement of Higgs boson decay to a pair of muons in proton-proton collisions at $\sqrt{s}=13\text{TeV}$: cds.cern.ch/record/2725423

A search for the dimuon decay of the Standard Model Higgs boson with the ATLAS detector: arxiv.org/abs/2007.07830

<https://phys.org/news/2020-08-cern-indications-rare-higgs-boson.html>



Wed, 05 Aug 2020

Using viscous metals in micro fibers

By Valene Geneux

EPFL scientists have developed the first micro-structured fibers with a viscous metal inside—a perfect example of what cross-disciplinary teamwork can achieve.

Platinum, copper, nickel and phosphorous—those are the components of an amorphous metal alloy with excellent mechanical properties. The alloy is also very corrosion-resistant and attract much interest in watchmaking and micromechanics. Now three scientists from EPFL's Laboratory of Photonic Materials and Fiber Devices (FIMAP) – Ph.D. student Inès Richard, postdoc Wei Yan and Professor Fabien Sorin—have given it a new purpose: they are using it to make electrodes for plastic fibers. Their paper, which was co-authored by Professor Jörg Löffler from ETH Zurich, has been published in *Nature Nanotechnology*.



Credit: Wei Yan/EPFL

A thin electrical conductor

"Our metallic glass is part of a new category of metals with an amorphous structure," says Richard. "When the alloy is heated to a certain temperature, it first turns viscous and then becomes crystalline and solid." The advantage is that while the alloy is in a viscous state, it can be stretched into a nanometric-sized, uniform shape that runs the length of the fiber. That's a step up from the

crystalline metals that are normally used—they're stretched while in a liquid state, which means they can break into droplets if their diameter gets too small.

"Thanks to this alloy and our work with Professor Vasiliki Tileli, who provided further insight into how the process works, we were able to create a very thin, electrically conductive fiber," says Professor Sorin. "It's just 40 nanometers thick—that's about 50 times smaller than a standard electrode fiber."

Making rats walk

Because the alloy is viscous, it can be combined with another liquid during the production process without the two mixing. "We added liquid selenium, which can detect light," says Yan. "The alloy is highly conductive, and because thanks to the high quality of the interface between both materials, it also enhanced the fiber's performance and sensitivity."

"We also worked with Professors Stéphanie Lacour and Grégoire Courtine to test our metallic glass fibers on rats," says Richard. Lacour helped develop a method for integrating the electrodes into chronic implants. Then Courtine's lab tested the implants' functionalities on rats. His researchers sent electrical impulses directly into the rats' brains, causing them to move, and recorded the signals from their neurons. The metallic glass fibers developed at EPFL are designed for use in biomedical devices and electronics.

More information: Wei Yan et al. Structured nanoscale metallic glass fibres with extreme aspect ratios, *Nature Nanotechnology* (2020). DOI: [10.1038/s41565-020-0747-9](https://doi.org/10.1038/s41565-020-0747-9)

Journal information: [Nature Nanotechnology](https://phys.org/news/2020-08-viscous-metals-micro-fibers.html)
<https://phys.org/news/2020-08-viscous-metals-micro-fibers.html>



Wed, 05 Aug 2020

Researchers create artificial organelles to control cellular behavior

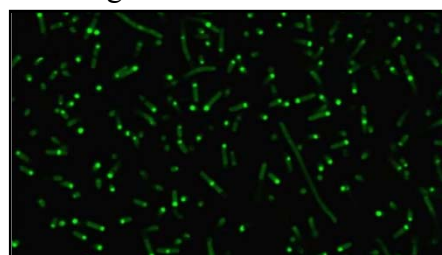
By Ken Kingery

Biomedical engineers at Duke University have demonstrated a method for controlling the phase separation of an emerging class of proteins to create artificial membrane-less organelles within human cells. The advance, similar to controlling how vinegar forms droplets within oil, creates opportunities for engineering synthetic structures to modulate existing cell functions or create entirely new behaviors within cells.

The results appear online on August 3 in the journal *Nature Chemistry*.

Proteins function by folding into specific 3-D shapes that interact with different biomolecular structures. Researchers previously believed that proteins needed these fixed shapes to function. But in the last two decades, a large new class of intrinsically disordered proteins (IDPs) have been discovered that have large regions that are "floppy"—that is, they do not fold into a defined 3-D shape. It is now understood these regions play an important, previously unrecognized role in controlling various cellular functions.

IDPs are also useful for biomedical applications because they can undergo phase transitions—changing from a liquid to a gel, for example, or from a soluble to an insoluble state, and back again—in response to environmental triggers, like changes in temperature. These features also dictate their phase behavior in cellular environments and are controlled by adjusting characteristics



Intrinsically disordered proteins (fluorescent green) clump together within cells to form artificial organelles. Credit: Duke University

of the IDPs such as their molecular weight or the sequence in which the amino acids are linked together.

"Although there are many natural IDPs that show phase behavior in cells, they come in many different flavors, and it has been difficult to discern the rules that govern this behavior," said Ashutosh Chilkoti, the Alan L. Kaganov Distinguished Professor of Biomedical Engineering at Duke. "This paper provides very simple engineering principles to program this behavior within a cell."

"Others in the field have taken a top-down approach where they'll make a change to a natural IDP and see how its behavior changes within a cell," said Michael Dzuricky, a research scientist working in the Chilkoti laboratory and first author of the study. "We're taking the opposite approach and building our own artificial IDPs from simple thermodynamic principles. This enables us and others to precisely tune a single property—the shape of the IDPs phase diagram—to better understand how this parameter affects biological behavior"

In the new paper, the researchers begin by looking to nature for examples of IDPs that come together to form "biomolecular condensates" within cells. These weakly-held-together structures allow cells to create compartments without also building a membrane to encapsulate it. Using one such IDP from the common fruit fly as a basis, the researchers draw from their extensive history of working with IDPs to engineer a molecularly simpler artificial version that retains the same behavior.

This simpler version allowed the researchers to make precise changes to the molecular weight of the IDP and amino acids of the IDPs. The researchers show that, depending on how these two variables are tweaked, the IDPs come together to form these compartments at different temperatures in a test tube. And by consistently trying various tweaks and temperatures, the researchers gained a solid understanding of which design parameters are most important to control the IDP's behavior.

A test tube, however, is not the same as a living cell, so the researchers then went one step further to demonstrate how their engineered IDPs behave within *E. coli*. As predicted, their artificial IDPs grouped together to form a tiny droplet within the cell's cytoplasm. And because the IDP's behavior was now so well understood, the researchers showed they could predictably control how they coalesced using their test tube principles as a guide.

"We were able to change temperatures in cells to develop a complete description of their phase behavior, which mirrored our test tube predictions," said Dzuricky. "At this point, we were able to design different artificial IDP systems where the droplets that are formed have different material properties."

Put another way, because the researchers understood how to manipulate the size and composition of the IDPs to respond to temperature, they could program the IDPs to form droplets or compartments of varying densities within cells. To show how this ability might be useful to biomedical engineers, the researchers then used their newfound knowledge, as nature often does, to create an organelle that performs a specific function within a cell.

The researchers showed that they could use the IDPs to encapsulate an enzyme to control its activity level. By varying the molecular weight of the IDPs, the IDPs hold on the enzyme either increased or decreased, which in turn affected how much it could interact with the rest of the cell.

To demonstrate this ability, the researchers chose an enzyme used by *E. coli* to convert lactose into usable sugars. However, in this case, the researchers tracked this enzyme's activity with a fluorescent reporter in real-time to determine how the engineered IDP organelle was affecting enzyme activity.

In the future, the researchers believe they could use their new IDP organelles to control the activity levels of biomolecules important to disease states. Or to learn how natural IDPs fill similar cellular roles and understand how and why they sometimes malfunction.

"This is the first time anybody has been able to precisely define how the protein sequence controls phase separation behavior inside cells," said Dzuricky. "We used an artificial system, but we think that the same rules apply to natural IDPs and are excited to begin testing this theory."

"We can also now start to program this type of phase behavior with any protein in a cell by fusing them to these artificial IDPs," said Chilkoti. "We hope that these artificial IDPs will provide new tool for synthetic biology to control cell behavior."

More information: Michael Dzuricky et al. De novo engineering of intracellular condensates using artificial disordered proteins, *Nature Chemistry* (2020). [DOI: 10.1038/s41557-020-0511-7](https://doi.org/10.1038/s41557-020-0511-7)

Journal information: [Nature Chemistry](https://phys.org/news/2020-08-artificial-organelles-cellular-behavior.html)
<https://phys.org/news/2020-08-artificial-organelles-cellular-behavior.html>

COVID-19 Research News



Wed, 05 Aug 2020

Coronavirus | No specific drug, vaccine for COVID-19 yet, says ICMR

Social distancing and hygiene continue to be best protection against virus, he says

By Bindu Shajan Perappadan

New Delhi: There is currently no specific drug or vaccine for COVID-19 and while the pandemic is progressing rapidly, vaccine development is taking time, Indian Council of Medical Research (ICMR) Director General Dr. Balram Bhargava said at a press conference on Tuesday. He emphasised that social distancing and hygiene continue to be the best protection against the virus.

And the Union Health Ministry said the country had now registered its lowest COVID-19 case fatality rate at 2.10 %, with 50% deaths registered in the age group of 60 or above and 37% in the 45-60 age group.

Health Secretary Rajesh Bhushan said, "While COVID-19 has spread to newer areas, India's current caseload of 66% is from 50 districts and 82% cases is limited to 10 States. In the last 24 hours, 0.27% of the total active cases are on ventilators across the country and at no point did we reach the 1% mark of patients using ventilators. Currently, we are not concerned about under-reporting of COVID-19 deaths as the Ministry had issued written guidelines about deaths that should be categorized as COVID deaths. India now has 5,86,298 active COVID-19 cases with over 12 lakh recoveries". India had done over 2 crore tests, which included both RT-PCR and Rapid Antigen tests.

The cumulative positivity of the country was now 8.89% and the States with positivity less than 10% were Punjab, Rajasthan, Madhya Pradesh, Uttar Pradesh, Haryana, Assam, West Bengal and Karnataka. "Last week's positivity of India was 11%, which means a few States are showing a rise in COVID-19 cases," he observed.

Ventilators

Speaking about the progress India had made in terms of making ventilators, he said that in 2019, the Indian ventilator market was roughly estimated as 8,510 units, valued at ₹ 444.74 crore.



Director-General of Indian Council of Medical Research (ICMR), Balram Bhargava, addresses a press conference on COVID-19 pandemic, in New Delhi on August 4, 2020. | Photo Credit: PTI

“Today, we find ourselves in a comfortable position on ventilators and currently 96% ventilators being procured are indigenous. Also, of the 60,000 ventilators procured 50,000 were funded by the PM-Cares Fund, which comes to about 2000 crore,” he pointed out.

Dr. Bhargava said States have been asked to enhance their number of tests, analyse their data and mount a response that was appropriate. Many States have increased their testing capacity, both RT-PCR and Rapid Antigen tests, with several performing more than 140 tests a day a million population. “Goa, Delhi, Tripura and Tamil Nadu have increased their testing capacity,” he noted.

When asked about the possible mutation of the virus, Dr. Bhargava said that all three strains of SARS-CoV2 in circulation were very similar and very minor mutations seem to have happened. “Typically, a virus takes 10-50 years to majorly mutate. As for the sero survey results, we are hopeful that it will be peer reviewed and published in a couple of weeks in the *Indian Journal of Medical Research*,” he added.

Vaccine development

Giving details of vaccine development across the world, Dr. Bhargava said 141 vaccine candidates were under consideration, with 26 of these under clinical trials.

“At the present moment, in India, we have three vaccines that are in different phases of clinical testing. Two indigenous ones - the Bharat Biotech vaccine and the DNA vaccine of Zydus Cadila have completed phase 1 and will begin phase 2, while the Oxford vaccine is in phase 2 and 3 currently,” he stated.

<https://www.thehindu.com/news/national/coronavirus-no-specific-drug-vaccine-for-covid-19-yet-says-icmr/article32270132.ece>

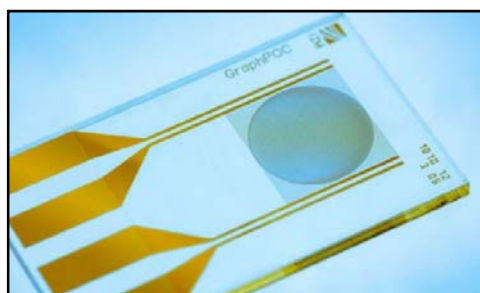


Wed, 05 Aug 2020

Researchers develop a graphene oxide-based rapid test to detect infections

Researchers at the Fraunhofer Institute for Reliability and Microintegration IZM have joined forces with partners in industry and healthcare to develop a handy graphene oxide-based sensor platform to detect acute infections such as sepsis or the antibodies against the coronavirus within minutes.

The current situation with the COVID-19 pandemic underscores the importance of detecting infections quickly and accurately to prevent further spread. Today, symptoms provide the clues that help diagnose viral or bacterial infections. However, many infections have similar symptoms, so these signs can easily be misread and the disease misdiagnosed. Blood tests provide certainty, but laboratories only carry these out when prescribed by the family physician. By the time the results arrive from the lab, doctors have often prescribed an antibiotic that may well be unnecessary.



Fraunhofer researchers are developing graphene oxide-based biosensors to detect bacterial and viral infections within just 15 minutes. Credit: Fraunhofer IZM

Just one drop of blood for a diagnosis

Researchers at the Fraunhofer IZM in Berlin have been working on the project Graph-POC since April 2018 on a graphene oxide-based sensor platform to rise to precisely these challenges in diagnosing infections. A single drop of blood or saliva is all it takes to perform an accurate analysis. Just a few minutes after the drop is applied to the sensor's surface, electrical signals convey the test result to the family doctor's office. This rapid test provides certainty within just 15

minutes to replace the protracted blood work in the lab. It takes the error and guesswork out of diagnosis so the physician can prescribe the appropriate treatment or suitable antibiotics.

The test may also be set up to detect antibodies that are present after a patient has recovered from an infection. Fraunhofer IZM researchers are now focusing on this application to detect earlier infections with the COVID-19 virus, which can help with efforts to trace how the infection has spread. The human body forms molecules or proteins called biomarkers in response to an infection. Capture molecules placed on the surface of the graphene-based sensor to detect these biomarkers. Differential measurements of biomarkers' concentration determine if an infection is present.

3-D structure to enlarge the measuring surface

This sensor platform's most remarkable feature is its base material: Electrically conductive and biocompatible, graphene oxide is also a very reliable means of detection. To date, it has only been used in microelectronics in its original form, a 2-D monolayer. Fraunhofer IZM researchers are now applying it in a 3-D structure in form of flakes. This 3-D form increases the measuring surface and the accuracy of measurements.

Manuel Bäuscher, scientist at Fraunhofer IZM and sub-project manager at Graph-POC, sees great prospects ahead for these graphene oxide sensors: "We can pivot from the current medical field to also develop in the direction of the point of need; that is, towards environmental technology and the detection of environmental impacts. But of course the corona application is our first priority." The graphene oxide flakes' 3-D array and heightened sensitivity also open the door to further applications. For example, it could detect harmful gases such as carbon monoxide or acetone even at room temperature. As it stands, these gases have to first be heated to trigger a surface reaction that today's sensors can detect. The graphene oxide sensor reacts at lower temperatures when metal oxides bond with its sensitive surface.

Fraunhofer IZM researchers are taking on another challenge to scale the production process up for mass manufacturing: They are looking to apply the graphene oxide coating at the wafer level so that hundreds of chips can be processed at once.

Antibodies detectable after coronavirus infections in about one year

The graphene oxide-based sensors have to be integrated into a plastic carrier and the reliability of the system have to be tested before the rapid tests can be deployed. Although the original project to detect infections is slated to run until spring 2021, the researchers do not expect to be able to verify the sensor for the coronavirus for another year yet. The partners in this project are the Charité, Aptarion Biotech AG, Technische Universität Berlin, MicroDiscovery GmbH and alpha-board GmbH. It is funded by the German Federal Ministry of Education and Research (BMBF).

<https://phys.org/news/2020-08-graphene-oxide-based-rapid-infections.html>

Bharat Biotech, Zydus Cadila complete phase I of Covid-19 vaccine trials in just 3 weeks

The completion of trials in a short period of time—enrolment and human dosing of the vaccine candidates had started only in mid-July—is likely to be unprecedented

By Leroy Leo

New Delhi: Bharat Biotech International Ltd and Zydus Cadila Ltd have completed the phase I of clinical trials for their respective vaccine candidates against covid-19, just three weeks after the two companies started human dosing of the immunisation shots against the fatal respiratory disease, Indian Council of Medical Research director general Balram Bhargava said.

“At the present moment, we have three vaccines in different levels of clinical testing. The first one is the inactivated virus vaccine, which is the Bharat Biotech vaccine, which has completed its Phase I study in 11 sites, and has started its phase II study... Similarly, for the DNA vaccine for Zydus Cadila, India has completed the phase I and has embarked on the phase II studies at 11 sites,” Bhargava said at a press conference on Tuesday.

Bharat Biotech refused to comment on Bhargava’s statement while calls and messages sent to Zydus Cadila’s spokesperson remained unanswered at the time of publishing.

The two companies had both received approval from the Drug Controller General of India V.G. Somani for conducting simultaneous phase I and II trials, which studies the vaccine’s safety and immunogenicity--ability to provoke an immune response in the body--respectively. The approval allowed the companies to start with the second phase without complete analysis of data of the first phase.

The completion of trials in a short period of time—enrolment and human dosing of the vaccine candidates had started only in mid-July—is likely to be unprecedented.

The phase I trial is faster than even the candidate developed by University of Oxford, which is considered a front runner among the vaccines being developed against covid-19 globally. It had started human dosing on April 22 and completed the first phase in a month.

The vaccine candidate, being co-developed by Astrazeneca plc, is currently in the third phase of trial in multiple countries, with trials by Serum Institute of India getting a go ahead from the Drug Controller General of India’s office on Monday.

AstraZeneca plc, co-developer of Oxford’s vaccine, has signed a pact with Serum Institute in June to supply an additional 1 billion doses, principally for low- and middle-income countries.

Serum Institute, which is the world’s largest vaccine manufacturer by number of doses produced and sold globally, will conduct phase II and III trials at 17 sites across India within a week, Bhargava said.

Trial protocol for Bharat Biotech’s candidate showed that phase I studies were to be conducted through administration of vaccine two weeks apart, with monitoring of adverse events happening after 2 hours of the first dose and then seven days. Later, monitoring would happen at regular intervals throughout the study duration.

On the other hand, Zydus Cadila’s trial protocol indicated that the first phase would last for 84 days, or 12 weeks, with three doses being administered 28 days apart and monitoring at regular intervals, while the second phase will be conducted in parallel till the 224th day. However, as per Bhargava, the phase I trial were completed within three weeks.

“These are pandemic times, and I know, everyone is compressing (trial) timelines. Some are wrapping up a phase, analysing data and then moving to the next phase. Others conducting a parallel phase I and II, and they are overlapping with each other... They have to make sure they

also monitor the safety in phase II and phase III, and it becomes even more important given the timelines are being compressed," public health and bioethics researcher Anant Bhan said.

<https://www.livemint.com/news/india/bharat-biotech-zydus-cadila-complete-phase-i-of-covid-19-vaccine-trials-in-just-3-weeks-11596548489120.html>



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Explained: Why are so many vaccines being developed all at the same time?

Vaccine development is a complex, time-consuming, resource-intensive process, and the chances of success are extremely low

By Amitabh Sinha, Prabha Raghvan

New Delhi, Pune: According to the latest list of the World Health Organization (WHO), at least 165 vaccines for the novel coronavirus were being developed across the world. There are possibly more. As Dr Davinder Gill, former CEO of Hilleman Laboratories, puts it, the actual number would probably be three times the number listed by WHO.

Those listed have all entered at least the pre-clinical trials stage. Some are in the final stage of human trials, possibly only a few months away from hitting the market (a Russian vaccine promises to be ready in weeks), while many others are just getting into animal trials, and are perhaps a couple of years away from becoming ready.

But why are so many vaccines being developed all at the same time? Here are some possible answers:

Vaccine development is a complex, time-consuming, resource-intensive process, and the chances of success are extremely low.

Of every 100 candidates that are considered in laboratories, barely 20 make it to the pre-clinical trial stage. This means almost 80% of the candidates are not even considered suitable to be tried on animals. Then, not more than five of the original lot are approved for human trials, and out of these, not more than one or two stand a chance of being approved for public use.

In the current context, the 165 candidates listed in the WHO survey have all reached at least the pre-clinical trial phase. And, at least 23 of them are in human trials. Not all of these will be successful.

Though we are all being given to understand that it was only a matter of a few months before some of the leading candidates, like that being developed by Oxford University, would be available in the market, the reality is quite different. Even those that are in the final stages of human trials, with encouraging results from previous stages, are not guaranteed to succeed.

Phase-III trials, in which the candidate vaccine is tested for its ability to prevent infection in humans in real-life situations (outside of laboratory conditions), are the toughest part of the trial. Countries that have robust regulatory systems are unlikely to lower their bar just because of the current emergency. The effectiveness of vaccine in phase-III trials is crucial.

In the end, we are not staring at a possibility of hundreds of coronavirus vaccines. Even if only five or six succeed, that would be considered a very good success rate.

Multiple vaccines are needed

Considering that everyone would want to get their hands on a vaccine as quickly as possible, one vaccine is unlikely to meet the immediate global demand. There are already indications that some countries may corner a bulk of the new vaccines, leaving others to wait for them to become available at a later date. The US, for example, has entered into billion-dollar agreements with

multiple leading contenders, and booked hundreds of millions of doses in advance. This could potentially restrict access for other countries, especially in the developing and poor world.

That is why several countries have started their own initiatives at developing a vaccine. Countries like Egypt, Thailand, Nigeria, Argentina, which are not known for vaccine research, are all in the race. Even if they are a little late, if successful, they would have control over production and supply.

“Having a diversity of candidates reduces the possibility of bullying by sectors within a country or by... countries against one another because there are more vaccines with more different distribution channels,” Marc Lipsitch, professor in the Department of Epidemiology at the Harvard T H Chan School of Public Health, said at a symposium last week.

There is another reason why multiple vaccines help. There is no guarantee that the first one would be the most effective. These vaccines are being developed in haste, and there is every likelihood that the ones that come later are able to learn from the experiences of the earlier ones, and make modifications to become more effective.

New technologies being tried

As they race against time, research groups around the world are testing several cutting-edge technologies in vaccine development, some of which have never succeeded in delivering a final product.

“Some of these are bleeding-edge technology. They’re the newest of the new,” said Gill.

For example, a DNA-based or RNA-based approach to produce a vaccine has not succeeded till now. But these approaches are being tried out to develop a coronavirus vaccine, because they are potentially quicker and easier to make.

In this approach, the genetic material of the virus (either DNA or RNA; and RNA in case of the coronavirus that causes Covid-19) is injected inside the body to trigger an immune response. In traditional approaches, which have succeeded in the past, scientists inject weakened live virus, or a dead virus, or a key protein of the virus to trigger an immune response.

“Before anyone could grow the virus in tissue culture, there were sections of industry and academia preparing a vaccine using newer technologies like nucleic acid-based platforms,” said Dr Vineeta Bal, an immunologist and visiting professor, at IISER, Pune. “Everybody is trying different approaches and some are seeing positive developments. Like Moderna (whose RNA-based candidate is in phase-III trials)... this is the first time that this kind of vaccine has reached the stage it has reached.”

The deployment of these newer technologies has increased the number of candidates. Some researchers are in the race for the learning experience as well. “In this mix of hundreds of companies, some, of course, are seeing this as an opportunity to build the capacity, raise capital and get their name out there,” said Gill.

Funds are available

Vaccine development is a very costly endeavour, requiring hundreds of millions of dollars. In normal times, only big pharmaceutical giants with deep pockets and risk appetite, or institutions with large research grants get into vaccine development.

Now, from governments to donor agencies to multinational corporations to international health initiatives, all have opened their purse strings for a coronavirus vaccine. Every candidate that shows promise in the laboratories is being backed.

Bal offers an interesting perspective. “The practice that has been observed over the years is that, if developed countries are affected, technological development for a solution is often fast-tracked. Here, you have countries in the West that are affected... By comparison, if you look at the development of vaccines for diseases of developing countries like TB and malaria, which have been around for much longer, there isn’t the same level of enthusiasm,” Bal said.

Commercial interests are also playing a role. “You have to remember that the chances of this virus spreading are much higher than other coronaviruses. This gives not only a larger market to

vaccine companies, but also encourages them to enter the space because of the kind of countries that are impacted,” said Bal.

And Gill said: “I think the potential is actually huge. If you make the assumption that the vaccine works across (all age groups and comorbidities)... you’re looking at an unprecedented, blockbuster, multi-billion-dollar potential for this product.”

<https://indianexpress.com/article/explained/vaccine-development-for-covid-19-explained-6538681/>



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Frontrunner Oxford vaccine for Covid-19 cleared for advanced trial in India

SII, the world's largest maker of vaccines, has a tie-up with AstraZeneca, the Swedish-British pharma giant, to manufacture the Covid-19 vaccine for low- and middle-income countries

By Prabha Raghavan, Anuradha Mascarenhas

India’s top drug regulator has approved the application of Serum Institute of India (SII) to conduct late-stage human trials in the country for the Oxford-AstraZeneca Covid-19 vaccine candidate.

Researchers in Oxford announced last month that their candidate had triggered an immune response in humans against the novel coronavirus in early trials. The Oxford candidate is considered to be one of the global frontrunners for the Covid-19 vaccine, along with candidates being developed by Moderna with the US National Institute of Allergy and Infectious Diseases, and Pfizer with BioNTech.

SII, the world’s largest maker of vaccines, has a tie-up with AstraZeneca, the Swedish-British pharma giant, to manufacture the Covid-19 vaccine for low- and middle-income countries. The vaccine is already being tested in the UK, South Africa and Brazil, where participants are being administered two doses nearly a month apart.

The clearance from the Drugs Controller General of India (DCGI) who heads the Central Drugs Standard Control Organisation (CDSCO) came after an expert committee on Friday accepted a revised proposal submitted by SII.

The Institute can now start larger phase II/III trials of the candidate in India, ahead of Bharat Biotech’s Covaxin and Zydus Cadila’s ZyCov-D, other candidates that are still in phase I/II trials. The trials for Covishield – the name given to the candidate technically referred to as AZD1222 or ChAdOx 1 nCoV-19 – will have around 1,600 participants at 18-odd sites across the country, a senior government official had told The Indian Express earlier.

Explained

Hope and caution

The Oxford vaccine offers one of the most promising weapons against the virus. Despite the promise, it is important to remember though, that the road ahead remains uncertain, and that the vaccine is still only a candidate.

“This (the DCGI clearance) will hasten the development of the Covid-19 vaccine,” the Union Ministry of Health and Family Welfare said on Monday.

The trial sites will likely include those identified by the National Biopharma Mission and Grand Challenges India Programme, a partnership between the government and the Bill and Melinda Gates Foundation. These include the INCLIN Trust International in Palwal, Haryana, KEM Hospital in Pune, Society for Health Allied Research and Education in Hyderabad, National Institute of Epidemiology in Chennai, and Christian Medical College in Vellore.

Department of Biotechnology (DBT) secretary Dr Renu Swarup had earlier told The Indian Express that these sites had been readied as part of India's preparations for final stage trials for the Oxford vaccine candidate.

Other trial sites may include the All India Institutes of Medical Sciences (AIIMS) in Delhi and Jodhpur; BJ Medical College and Sassoon General Hospital, Jehangir Hospital, and Bharati Hospital in Pune; Rajendra Memorial Research Institute of Medical Sciences (RMRIMS) in Patna; Mysore's JSS Academy of Higher Education and Research; Nehru Hospital in Gorakhpur; Andhra Medical College in Visakhapatnam; and the Post Graduate Institute of Medical Education and Research (PGIMER) in Chandigarh.

It was not immediately clear when SII planned to begin the trials. Queries sent to the firm remained unanswered until press time on Monday. SII CEO Adar Poonawalla had told The Indian Express earlier that trials would begin this month after regulatory approvals were received and, if all went well, the vaccine could be out by the end of the year.

Dr Sanjay Lalwani, medical director at Pune's Bharati Hospital, said it would take at least a week to get the ethics committee's approval before the trials could start. Pathik Divate, director of Jehangir Clinical Development Centre, said their ethics committee would meet soon to check and approve the revised protocol.

Dr Ashish Bawdekar, principal investigator at Pune's KEM Hospital, said each clinical trial site could get around 200 participants, but at least 160 would be enrolled. It could be two weeks before the trial starts, he said.

On Friday, the CDSCO's Subject Expert Committee (SEC) for Covid-19 related therapies recommended that authorisation to market Covishield should be granted after considering clinical data generated from both the India and international trials. Trial participants in India should be given paracetamol afterward if required.

The Indian Express had reported on Friday that the SEC had recommended that CDSCO grant permission to SII to conduct phase II/III trials here after the firm had submitted a revised protocol. DCGI Dr V G Somani is learnt to have approved the proposal late on Sunday.

One of the reasons why SII had to revise its protocol was that the SEC felt the firm needed to take a "pan India" approach while considering trial sites. While it is unclear how many trial sites were proposed by SII in its earlier protocol, Poonawalla had earlier told The Indian Express that it intended to conduct the trials in Pune and Mumbai only.

Following suggestions to make eight changes, SII had speedily amended its proposal and resubmitted it for consideration within the course of a day, it is learnt.

<https://indianexpress.com/article/india/coronavirus-vaccine-oxford-india-trial-6538061/>

