

Combating *Aedes*

Researchers have discovered that a common bacteria, *wolbachia*, can inhibit virus infections in mosquitoes



TECH-ENABLED

DEVANGSHU DATTA

One of the more interesting ways to combat mosquito-borne diseases is by infecting the mosquitoes with a parasite. The *Aedes aegypti* mosquito hosts the viruses responsible for dengue, Zika, yellow fever and chikungunya. Female mosquitoes bite infected humans and pick up those viruses, which flourish within the mosquitoes' cells. These diseases are passed on when the infected mosquito bites somebody else.

Dengue causes 50-100 million infections every year while Zika epidemics in the Latin America have had terrible effects on new-born babies. Yellow fever affects Brazil and Africa and chikungunya has caused epidemics across continents. Researchers have discovered that a common bacteria, *wolbachia*, can inhibit virus infections in mosquitoes. The *wolbachia* bacteria is a parasite that comes in multiple strains. It is naturally present in 60 per cent of insect species, as well as in some nematodes (worms). But *aedes* is not a normal host for *wolbachia*. The bacteria works in two ways to inhibit virus infections. It seems to boost the mosquito immune system, which makes it harder for viruses to infect the insect. It also competes with viruses for key molecules like cholesterol. Viruses need cholesterol to survive and *wolbachia* is more efficient at consuming cholesterol. Hence it starves any virus that does infect the mosquito. Some strains of *wolbachia* present in nematodes are dangerous. They can

cause inflammation that results in filaria and other diseases. But the strains used by researchers in the anti-mosquito experiments don't harm human beings, or large animals. This makes the introduction of the bacteria to the mosquito (the bacteria is present everywhere, anyhow) safe and environmentally sustainable. Researchers at Universities in Melbourne and Glasgow and the Institute for Medical Research in Malaysia have worked with the World Mosquito Program (WMP) to experiment with the introduction of *wolbachia* to *aedes* populations. In 2011, researchers led by Scott O'Neill, a professor at the Monash University in Melbourne, Australia, started injecting *wolbachia* into *aedes* eggs, after harvesting the bacteria from fruit flies where it is naturally present. After hatching, the *wolbachia*-infected *aedes* were released into pilot areas in Queensland to mate with wild *aedes* populations. Over time, the disease incidences of these pilot zones were com-

pared to nearby control areas where *wolbachia*-mosquitoes were not present. The mating of a *wolbachia*-infected male mosquito with an uninfected female mosquito results in sterile eggs. But *wolbachia*-infected female mosquitoes can breed with uninfected males, and produce offspring born carrying *wolbachia*. These *wolbachia* carrying mosquitoes spread through the population in successive generations. Over time, this brings down infection rates for endemic viral diseases. This method could be more effective in the long run than insecticide sprays and less likely to cause health and environmental hazards. It is also cost effective since the bacteria propagates by itself, generation by generation. There is statistical evidence that these experiments are working. The researchers claim Northern Queensland is almost disease-free due to this treatment. The WMP has set up projects in 12 countries and carrying mosquitoes covered populations of over 4 million people by June 2019. In Yogyakarta, Indonesia, municipal records indicated 76 per cent reduction in dengue infections in the 30 months since the release of the first batch of treated mosquitoes in a pilot zone, compared to the rates in adjoining control areas. Similarly, pilot projects in Brazil have led to a 75 per cent drop in chikungunya cases com-

pared to untreated control sites. Early studies involved one strain of *wolbachia*, known as wMel. But wMel can't handle really high-temperatures. Another team discovered that a different strain of *wolbachia* has better results in high temperature regions. This second team is led by Steven Sinkins, a vector biologist at the University of Glasgow and it introduced the high-temperature strain, wAlbB, in six pilot neighbourhoods in Kuala Lumpur. A study published in Current Biology reports that the second strain seems to thrive even in peak daily temperatures exceeding 36°C. The WMP claims three independent risk assessments have been conducted on the *wolbachia* method. It says there is negligible risk associated with the release of *wolbachia* carrying mosquitoes; the bacteria is safe for people, animals and the environment. Hence, the concept has regulatory approval from government bodies in all countries where WMP has worked. Other biological methods of combating *aedes* carry more risks. Genetically modifying mosquitoes to prevent breeding takes a very long time to affect large populations. Wiping out a local mosquito population could also have negative environmental consequences — the insects are an important part of the food chain. The WMP may now be looking to scale up the *wolbachia* method.

CHINESE WHISPERS

Cracking the whip



The Bahujan Samaj Party (BSP) has expelled some senior leaders, alleging indiscipline and working against the interests of the party. They include former state ministers and legislators. Many of these crestfallen leaders had contested the 2019 Lok Sabha polls and recent by-elections in Uttar Pradesh, but lost. Party chief Mayawati has also expelled C L Verma, a trusted colleague who had contested the Lok Sabha election from the Mohanlalgarj (reserved) seat in Lucknow, but lost to Bharatiya Janata Party candidate Kaushal Kishore. Interestingly, Verma was a close confidant also of former UP minister Naseemuddin Siddiqui, who, in turn, was a true-blue follower of Mayawati before he fell out with her and joined the Congress.

Five enquiries not enough

The forest department of the Madhya Pradesh government is planning to conduct a record sixth enquiry into a plantation scam that supposedly took place when the Bharatiya Janata Party (BJP) was in power. The scam is of July 2017 vintage. The state government took a mammoth drive to plant 70 million saplings on a single day in the state. Forest Minister Umang Singh, of the Congress, called it "systemic siphoning off of public funds". The forest department had reported that the plantation data was exaggerated. In the fresh enquiry, the government will also assess the capacity of the nurseries in the state.

Better safe than sorry

As onion prices touched ₹100 a kg in some parts of the country and as reports of consumers scrambling for the staple poured in, members of a co-operative society decided to take protection before distributing subsidised onions to consumers. Vendors of the Bihar State Cooperative Marketing Union were seen wearing helmets while unloading sacks of onions priced at ₹35 a kg for distribution. They had set up their stalls near Gandhi Maidan in Patna on Saturday. There were reports of onions being stolen from the stalls in the past couple of weeks. With no assurance of safety from the authorities, the vendors decided to make themselves safe.

Brace up for the sixth rate cut in a row

In his toughest policy, Shaktikanta Das, who completes his first year at RBI this month, must reassure the market that the fiscal slippage is priced in



BANKER'S TRUST

TAMAL BANDYOPADHYAY

Indian economy growing at 4.5 per cent in the September quarter, falling for the sixth quarter in a row, is no surprise. There will also be no surprise if the monetary policy committee (MPC), the policy making body of the Indian central bank, goes for yet another rate cut next week. Will it be a 25 basis points (bps) cut to bring down the policy rate to 4.90 per cent? Or, a 15 bps cut to 5 per cent? One bps is a hundredth of a percentage point. The historic low policy rate in Asia's third largest economy was 4.75 per cent when the Reserve Bank of India (RBI) cut it by 25 bps in April 2009, the last in a series of rate cuts in the aftermath of the fall of Lehman Brothers Holdings Inc. in September 2008, leading to deep recession in many parts of the world. The MPC was not in place then. Between October 2008 and April 2009, the RBI cut the policy rate by 325 bps, from 9 per cent to 4.75 per

cent. This time around, the policy rate has been pared by 135 bps in five phases since February 2019. Since current Governor Shaktikanta Das took over in December 2018, every monetary policy has announced a rate cut. If the December policy does an encore, Das will equal D Subbarao's record of six rate cuts in a row in 2008-09, albeit in a different context. In 2009, the rate was cut to insulate the Indian economy from the impact of global recession; this time around, debates have been on to dissect the internal causes of a severe economic slowdown — structural or cyclical. What has changed since the October policy? The external environment has improved. The US Federal Reserve seems to be done with rate cuts for the time being and the European Central Bank is expected to stay on hold. The Bank of England's action will depend on the fate of Brexit. In India, the pangs of slowdown have become more evident. The GDP, which grew at 5 per cent in the first quarter of the current fiscal year, has grown 4.5 per cent in the second quarter, the worst in six years. It was not a shocker. Eight infrastructure sectors of the core sector contracted for the second consecutive month by 5.8 per cent in October, signalling the depth of the slowdown. The anaemic growth in bank credit corroborates the story. The output gap is widening and the MPC's stated stance is "intensified efforts to restore the growth momen-



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tum". While paring the rate, the last policy statement conveyed the MPC decision to "continue with the accommodative stance as long as it is necessary to revive growth, while ensuring that inflation remains within the target". Does the latest inflation figure queer the pitch? The retail inflation rose 4.6 per cent in October against 4 per cent in September, higher than consensus expectation. However, it was driven by food prices but the so-called core or non-food, non-oil infla-

tion dropped. Higher inflation should not come in the way of RBI cutting the policy rate yet again. However, the central bank may have to revise its inflation projection upwards and growth projection downwards. In October, the retail inflation projections were revised slightly upwards to 3.4 per cent for the second quarter of 2020 but projections for the second half of the year were retained at 3.5-3.7 per cent. Most analysts see retail inflation above 4 per cent by year-end but within 4 per cent one year ahead. The MPC's flexible inflation target is 4 per cent with a plus/minus 2 per cent band. In October, the real GDP growth projection for 2019 was revised downwards — from 6.9 per cent to 6.1 per cent; 5.3 per cent in the second quarter of 2019-20 and in the 6.6-7.2 per cent range for the second half of the year. The GDP growth for the first quarter of 2020-21 was also revised downwards to 7.2 per cent. The September quarter growth figure will douse the central bank's optimism on economic growth. Every successive rate cut diminishes its marginal utility but the current economic scenario does not leave the MPC with any choice — it will probably go for a cut now and one more in March. The question is: Will it be 25 bps or a token 15 bps for now with an assurance for continuing with the accommodative stance and further cuts in the future if the growth moment does not pick up? This is the toughest policy for Das.

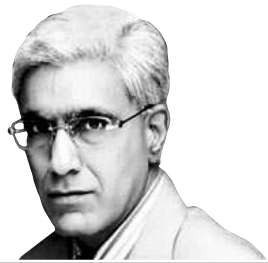
Instead of keeping mum on the worries about fiscal deficit (and reiterating the central bank's faith in the government's ability to stick to the estimated 3.3 per cent deficit for 2020 when the deficit in the first seven months till October exceeded the target for the full year), he must spell out the RBI's take on it. The market does not trust the fiscal deficit figure. The proof of this is the spread between the policy rate and the 10-year government bond yield — around 135 bps. We do not see often such a wide spread in the midst of a rate cutting cycle and abundant liquidity in the system. If the sovereign cannot reap the benefit of a low policy rate, how does the RBI ensure transmission of rate cuts in the real economy? The 10-year bond yield (of the old paper) remains at almost the same level when the policy rate was 6 per cent (and a liquidity deficit of around ₹25,000 crore). Many want the RBI to start buying bonds from the market to bring down the yield or even launching an Indian version of quantitative easing. That's not done as there is at least ₹2 trillion excess liquidity in the system now — primarily driven by the central bank's dollar purchase from the market and higher government spending. The RBI can probably step in when the government announces additional borrowing from the market but the challenge before Das now is to reassure the market that the fiscal slippage is priced in.

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AS I SEE IT

Wrong R-Day chief guest?

On any other day the Brazilian President would be very welcome. On Republic Day, however, I would have preferred a person I can look up to



KARAN THAPAR

What is the difference between inviting a head of government on a state visit and inviting him or her as chief guest on Republic Day? I would say the first is an established practice for furthering diplomatic and political relations with key governments and countries. That's why Burmese military dictators, African tyrants and Islamic potentates are regularly welcomed. It's their country we're courting; their personality or character is of little concern. The second invitation is very different. That's because Republic Day has special significance. It's an occasion when we re-affirm our commitment to the Constitution and the democracy it guarantees. And what makes our Constitution truly meaningful is its vision of liberty and rights. So the chief guest on Republic Day should reflect the values and ideals our country upholds. That's why Nelson Mandela, in 1995, was the best possible choice. In contrast, is Jair Bolsonaro, the Brazilian President, the wrong one? There's no doubt Mr Bolsonaro is a controversial personality, particularly

in his own country. But are you aware why? If not, let me explain. It could determine his suitability as chief guest on January 26. First, he doesn't consider women the equal of men and has often spoken derisively of them. In a 2015 interview, he said men and women should not receive equal salaries. In a 2017 speech, he said of his five children the first four were male and the fifth, a daughter, was born out of "a moment of weakness". These, I accept, are flippant and silly remarks and not really incriminating. But what he said of Maria do Rosario, a former human rights minister, is very different. In a 2015 interview, where he claimed she had called him a rapist 12 years earlier, he said she's "not worth raping; she is very ugly". Then he added he wouldn't rape her because she doesn't "deserve it". These comments were widely condemned leading to a federal court conviction in September 2015. In June 2016, the Federal Supreme Court opened criminal cases against him. It ruled he had potentially incited rape for which he could face six months jail and a fine. In August 2017, an appeal court upheld the lower court's conviction. It was only when he became president, earlier this year, that the lawsuit was dismissed because he had acquired immunity from prosecution. If anything, Mr Bolsonaro's views on homosexuality are more disturbing. He told *Playboy* in a June 2011 interview, "I would be incapable of loving a gay son". In fact, he went on to say he would prefer such a son "die in an accident". A month later he told the magazine *Época* if such views "make me

prejudiced, then I'm prejudiced and very proud of it". In 2013 he said to Stephen Fry in a BBC interview "no father is ever proud of having a gay son" and "we Brazilians do not like homosexuals". In November 2017, the Court of Justice for the State of Rio de Janeiro convicted and fined Mr Bolsonaro for hate speech in a 2011 television programme where he said "there is no risk" of his family producing homosexual children because his children had received a "good education". At the time Judge Teixeira said: "You cannot deliberately attack and humiliate, ignoring the principles of equality, just because you invoke freedom of expression". Now it's true that after launching his presidential campaign Mr Bolsonaro has moderated his views. Today he claims he has nothing against gays. In fact, after his election he told *Jornal Nacional* that "aggression against a fellow man has to be punished in the way of law". But does that wipe out — leave aside forgive — his earlier views? Or is electoral expediency the reason why he's singing a different tune? I don't know and I'm not sure anyone else does either. Equally, I don't want to cast the first stone. None of us has a right to do so. But does Mr Bolsonaro as chief guest add to our veneration of the Constitution? Or does it suggest we're forgetting our values as Krishnan Srinivasan, a former foreign secretary and author of *Values in Foreign Policy*, believes? On any other day Mr Bolsonaro would be very welcome. On Republic Day, however, I would have preferred a person I can look up to.

LETTERS

Structural issues



This refers to "GDP growth slips to 4.5%" (November 30). That the country's GDP growth is at a 26-quarter low and eight core sectors including manufacturing, construction and mining have contracted by 8 per cent is a matter of serious concern. It is a clear indication that the measures unleashed by the Union government have not yielded any result on the ground. While the growth in the second quarter is largely driven by government spending, the prospect of government persisting with its higher spending remains low in the backdrop of a fall in its revenues. If the government decides to stick to its fiscal deficit target, it would further intensify the slowdown. Given the present circumstances, the monetary policy committee (MPC) might continue with its accommodative stance and cut the interest rates further. While sector-specific interventions can alleviate some pain in the core sectors of the economy, what is imperative at present is concrete steps towards addressing structural issues plaguing the economy. That holds the key to arresting the slowdown. M Jeyaram Tamil Nadu

All is not lost

Compliments for your editorial "Signals from Hong Kong" (November

29) beautifully analysing the ground realities in the country. Hope the authoritarian Chinese regime is listening. Hong Kong's unique attributes, which have been honed over centuries just can't be replicated in a year or two — as indeed the Chinese government has learnt through their efforts in Macao and Shanghai. Macao's beautiful casinos have managed to attract gamblers — especially from the sub-continent — but that, as you say, means only "limited success"; not even a small fraction of what Hong Kong has been doing. During the 22 years since the UK returned the territory to China, the Chinese government must've earned billions in taxes from businesses and people in Hong Kong. It has also enjoyed tremendous gains from Hong Kong being the financial window to the world and a critical transshipment hub for exports and imports. The unique one-country-two-systems template has indeed worked beautifully with both China and Hong Kong gaining hugely. Being ranked, the world's freest economy for 24 consecutive years is a great badge of honour. It is only because the government of China decided to deepen its control on the erstwhile city-state that all hell broke loose. They should've realised that the culture that prevailed there for almost two centuries cannot be changed by a police or military crackdown. Naturally, people rebelled and it has got so bad that, secretly, Chinese authorities must be regretting the steps taken by them. Suddenly, they



can see this big window closing and businesses from Hong Kong moving to Singapore or Tokyo. Even for a strong economy like China, this loss could be unbearable. All is not lost. The results of Hong Kong's district council elections -- in which pro-democracy candidates won over 90 per cent of the seats -- show that the Chinese regime did not extend their power to control these elections. On one hand, it has created a new set of challenges for the government. I feel, it is also an indication that things haven't yet gone beyond redemption. The Chinese government will do well to go easy and let things in Hong Kong return to how they were before June. Let the very astute Xi Jinping not worry about a loss of face. Krishnan Kalra Gurugram

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HAMBONE



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