



# DAILY NEWS BULLETIN

LEADING HEALTH, POPULATION AND FAMILY WELFARE STORIES OF THE DAY  
Tuesday  
20191119

## Air Pollution (Hindustan: 20191119)

[http://epaper.livehindustan.com/imageview\\_389294\\_60245200\\_4\\_1\\_19-11-2019\\_7\\_i\\_1\\_sf.html](http://epaper.livehindustan.com/imageview_389294_60245200_4_1_19-11-2019_7_i_1_sf.html)

प्राकृतिक, मानव जनित और रासायनिक रूपांतरण से सिंधु-गंगा मैदान बना प्रदूषण का केंद्र

# प्रदूषण की घातक परत से 47 करोड़ लोगों को खतरा

चिंताजनक

नई दिल्ली | मदन जैड़ा

प्रदूषण की समस्या से सिर्फ राष्ट्रीय राजधानी क्षेत्र (एनसीआर) ही नहीं जुड़ा रहा है, बल्कि गंगा-सिंधु नदियों का संपूर्ण मैदानी क्षेत्र इसकी चपेट में है। क्लाइमेट ट्रेड द्वारा सोमवार को जारी रिपोर्ट में कहा गया है कि प्रदूषण की घातक परत के कारण सात राज्यों की करीब 47 करोड़ की आबादी खतरे में है।

रिपोर्ट के अनुसार पश्चिम बंगाल से लेकर पंजाब तक सिंधु-गंगा मैदानी क्षेत्र एयरोसोल का बड़ा केंद्र बन गया है। ये एयरसोल प्राकृतिक भी हैं और मानव जनित भी। बड़ी मात्रा में रासायनिक रूपांतरण के जरिये भी पीएम 2.5 का निर्माण हो रहा है जो लंबे समय तक वायुमंडल में टिके रहते हैं। रिपोर्ट के



अनुसार गंगा और सिंधु के मैदानों में पंजाब, हरियाणा, उत्तराखंड, दिल्ली, उत्तर प्रदेश, बिहार तथा पश्चिम बंगाल में छाई एयरोसोल की परत में कुदरती कण जैसे समुद्री लवण, धूल, कोहरा और प्राकृतिक सल्फेट हैं। जबकि मानवजनित कणों में कालिख, औद्योगिक सल्फेट, ब्लैक कार्बन आदि शामिल हैं।

वैसे मानव जनित कणों की उत्पत्ति हर क्षेत्र में अलग-अलग है जो उस क्षेत्र की गतिविधियों पर निर्भर है। लेकिन कुदरती कणों और मानव जनित कणों

में रासायनिक रूपांतरण भी होता है। इस मौके पर आयोजित कार्यशाला में आईआईटी दिल्ली के सहायक प्रोफेसर साँगनिक डे समेत कई विशेषज्ञों ने कहा कि इस समस्या से निपटने के लिए प्रदूषण के स्रोतों को खत्म करना होगा और पूरे एयरशेड को लेकर क्षेत्रीय रणनीति बनानी होगी। लेकिन चिंता की बात यह है कि सरकार द्वारा बनाए गए राष्ट्रीय स्वच्छ हवा कार्यक्रम में कई प्रदूषित शहर नहीं हैं। इसके अलावा प्रदूषण के स्रोतों को खत्म करने के संसाधनों की कमी है।

मैदानी क्षेत्र में 1-15 नवंबर के बीच शीर्ष 10 प्रदूषित शहर

- गाजियाबाद
- नोएडा
- ग्रेटर नोएडा
- जौड़
- दिल्ली

- हिसार
- पानीपत
- गुरुग्राम
- फरीदाबाद
- कानपुर

(पीएम 2.5 का स्तर 250-350 के बीच दर्ज किया गया) पहले नौ शहरों में हवा की गुणवत्ता गंभीर श्रेणी में दर्ज की गई है।

50% पीएम 2.5 के पीछे रासायनिक रूपांतरण

सर्दियों में करीब 50 फीसदी पीएम 2.5 रासायनिक प्रक्रिया से ही निर्मित होता है। रिपोर्ट के अनुसार ऐसा सल्फरडाई ऑक्साइड, नाइट्रोजन डाई ऑक्साइड, वोलाटाइल अमोनिक कंपाउंड (वीओसी) और पोलीसाइकिल एरोमेटिक हाइड्रोकार्बन (पीएच) आदि के पार्टिकुलेट मैटर (पीएम 2.5) में तब्दील होने के कारण होता है।

मैदानी इलाकों से जल्दी नहीं निकलते प्रदूषक तत्व

रिपोर्ट में कहा गया है प्रदूषणकारी तत्व चाहे प्राकृतिक हों या मानवजनित, गंगा मैदानों में एक घाटीनुमा इलाके से बाहर नहीं निकलपाने के कारण पूरी सर्दियों के दौरान मैदानी इलाकों में जमे रहते हैं। सर्दी का मौसम शुरू होते ही बायोमास और अपशिष्ट के जलाने से ब्लैक कार्बन और कार्बनिक कण धुएं के रूप में निकलते हैं और गंगा के मैदानी क्षेत्र में प्रवेश कर जाते हैं। यह धुआं, वाहनों, कारखानों आदि से प्रदूषण के साथ मिलकर एक मोटी घातक धुंध बनाता है।

प्रदूषण पर केंद्रित फिल्म महोत्सव 27 नवंबर से

नई दिल्ली। आगामी 10वें सीएमएस वातावरण फिल्म महोत्सव में कुल 170 फिल्मों और डॉक्यूमेंट्री दिखाई जाएगी। इन फिल्मों में प्रदूषण विषय पर 90 लघु फिल्में हैं। पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय की ओर से आयोजित यह फिल्म महोत्सव 27 नवंबर से डॉक्टर आंबेडकर अंतरराष्ट्रीय केंद्र में शुरू होगा। यह सिर्फ सिनेमा कला का उत्सव मानने वाला महोत्सव नहीं है, बल्कि इसका मकसद फिल्म के माध्यम से प्रकृति के प्रति जागरूकता फैलाना है।

बुधवार से छाएगी स्मॉग की मोटी परत, फिर होगी मुसीबत

# तेज हवाएं पड़ गईं कमजोर, आज से फिर बढ़ेगा प्रदूषण

■ विशेष संवाददाता, नई दिल्ली

ठंडी तेज हवाओं ने दिल्ली को प्रदूषण से काफी राहत दिलाई। तीन दिन की राहत के बाद आज से स्मॉग की वापसी होगी और प्रदूषण फिर परेशान करेगा। हवाओं की गति में सोमवार रात से ही कमी आनी शुरू हो गई है। ऐसे में 20 नवंबर से स्मॉग की मोटी परत दिखाई देनी शुरू हो जाएगी। वहीं, प्रदूषण का स्तर 19 नवंबर को भी गंभीर के स्तर के करीब पहुंच जाएगा। सफर और आईएमडी दोनों ने इसी तरह के अलर्ट जारी किए हैं।

11 से 15 नवंबर तक दिल्ली में प्रदूषण की सबसे लंबी हेल्थ इमरजेंसी रही थी। जिसके बाद 16 नवंबर को हवाएं तेज हुईं और प्रदूषण छंट गया। तीन दिन दिल्ली एनसीआर ने प्रदूषण से राहत की सांस ली। सोमवार को दिल्ली का एयर क्वालिटी इंडेक्स (एक्यूआई) महज 214 रहा। यह बीते रविवार से भी एक पॉइंट कम है। इसके अलावा गाजियाबाद में 256, ग्रेटर नोएडा में 218, गुडगांव में 138, नोएडा में 227 दर्ज हुआ। तेज धूप और ठंडी हवाओं को लोग वीकेंड एंजॉय करते दिखे।

हवाओं की वजह से शनिवार रात प्रदूषण का स्तर करीब 6 घंटे तक सामान्य स्थिति में 200 से भी नीचे रहा। सफर के



धूल-मिट्टी को हवा में घुलने से रोकने के लिए पानी का छिड़काव जारी है



**पृथ्वी  
रक्षा**

मुताबिक दिल्ली में हवाओं की वजह से प्रदूषण का स्तर काफी कम हुआ है, लेकिन सोमवार की शाम से ही हवाओं की गति में कमी आनी शुरू हो गई है।

20 और 21 नवंबर को हवाओं की गति काफी कम रहेगी। जिसकी वजह से मंगलवार से ही प्रदूषण में इजाफा होगा। 19 नवंबर को एयर क्वालिटी इंडेक्स 350 से अधिक रहने की आशंका है। जबकि 20 और 21 नवंबर को यह गंभीर श्रेणी में रहेगा। हवाओं की गति कम होने के अलावा पराली का धुआं भी दिल्लीवालों को

परेशान करेगा। पंजाब और हरियाणा में बीते 24 घंटों में पराली के मामले बढ़े हैं। बीते रविवार को इनकी संख्या 610 रही। ऐसे में 19 नवंबर को पराली का धुआं दिल्ली को 13 परसेंट तक प्रदूषित कर सकता है।

आईएमडी के अनुसार 19 नवंबर से हवाएं कमजोर हो जाएंगी और प्रदूषण स्तर तेजी से बढ़ेगा। इसके चलते 20 नवंबर को प्रदूषण का स्तर एक बार फिर गंभीर स्तर में आने की संभावना है। सोमवार को हवाओं की गति 15 से 20 किलोमीटर प्रति घंटे रही जबकि मंगलवार को यह महज 4 किलोमीटर प्रति घंटे रह सकती है।

**Air quality to turn 'severe', EPCA tells NCR states to control pollution (The Indian Express: 20191119)**

<https://indianexpress.com/article/cities/delhi/air-quality-to-turn-severe-epca-tells-ncr-states-to-control-pollution-6126451/>

Taking heed of the warning, the Environment Pollution (Prevention and Control) Authority (EPCA) Monday wrote to chief secretaries of all four NCR states to step up surveillance and enforcement to control local sources of pollution and crop residue burning.

Weather forecast Today Live Updates: Delhi air quality to turn 'severe' again; heavy rainfall forecast in Tamil Nadu

Delhi: 'Pollution measures in place for 15 more days'

Sustainable living is happening, but not at the rate we expect: Dia Mirza

A discussion on air pollution and climate change is also scheduled to take place in the Lok Sabha Tuesday afternoon. (Photo: Reuters)

The brief improvement in Delhi-NCR's air quality may start deteriorating Tuesday, with agencies predicting a slip back into the 'very poor' and even 'severe' category by Thursday.

Taking heed of the warning, the Environment Pollution (Prevention and Control) Authority (EPCA) Monday wrote to chief secretaries of all four NCR states to step up surveillance and enforcement to control local sources of pollution and crop residue burning.

A discussion on air pollution and climate change is also scheduled to take place in the Lok Sabha Tuesday afternoon.

EPCA chairman Dr Bhure Lal has spoken to chief secretaries of Punjab and Haryana — the two main stubble burning states — to explain the gravity of the situation, said EPCA member Sunita Narain.

"The IMD has alerted us that the next few days, from Tuesday to Thursday, will have very little wind and ventilation. In this circumstance, dispersion of pollutants will not happen and there is a likelihood that we will slip back to the 'very poor' and even the 'severe' category," Dr Lal said in a letter to the chief secretaries of Punjab, Haryana, Uttar Pradesh and Rajasthan.

Delhi's average air quality index (AQI) Monday remained in the 'poor' category at 214.

Delhi CM Arvind Kejriwal Monday said a second round of odd-even road-rationing scheme, which ended last week, was not necessary for now as "the sky has cleared".

**Respite won't last long, EPCA warns of smog episode rerun (Hindustan Times: 20191119)**

<https://epaper.hindustantimes.com/Home/ArticleView>

Delhi's air quality improved marginally on Monday, with the AQI at 214 ('poor' category).

New Delhi : Though Delhi breathed easier on Monday, it stares at another episode of smog in the coming days due to slowing winds, with a likely increase in fog cover and a drop in mercury, allowing little ventilation, warned the Supreme Court-appointed Environment Pollution (Prevention and Control) Authority (EPCA) on Monday.

Following this, the apex court-panel wrote to governments of Haryana, Punjab and Uttar Pradesh urging them to "step up surveillance" and curb local sourced of emissions, including those from crop residue burning.

Delhi's air quality could plunge to 'very poor' or even 'severe' between Tuesday and Thursday on account of a combination of factors, the authority said. "The Centre-run system for pollution forecasting and research has informed that wind direction during this period is favourable for intrusion of stubble burning. If the burning is not checked, its contribution to overall pollution in Delhi could increase up to 13%," said Bhure Lal, chairperson, EPCA, in his letter to the chief secretaries of the three states.

The air quality index (AQI), as calculated by the Central Pollution Control Board's (CPCB) 4pm bulletin on Monday, was 214 in the 'poor' category. On Sunday, the AQI was 215 when air quality had improved to 'poor' after a four-day spell of pollution levels remaining in the 'very poor' and 'severe' categories.

"The air in the region has finally improved after days of dense and hazardous smog. However, the India Meteorological Department (IMD) has alerted that from Tuesday (November 19) to Thursday (November 21), there will be little wind and ventilation, which will not allow pollutants to disperse. Hence, the air quality could slip back to 'very poor' or 'severe' levels again," the letter read.

This situation could be further aggravated in case there is scant rain, as it will not be adequate to wash away the pollutants but will instead add more moisture to the air facilitating accumulation of pollutants, said Lal.

"We have seen this phenomenon in the past few weeks that when increased moisture allowed trapping of pollutants and created a cloud of haze and smoke, it resulted in a sharp drop in air quality," he added.

On November 3, Delhi saw its worst day in terms of air quality since 2016 when the AQI had spiralled to 494. The situation was caused by secondary pollutants (more harmful than levels

of ultrafine particulate matter 2.5), which had formed because of high moisture resulting from scant rainfall the previous day.

According to IMD scientists, air quality could deteriorate on November 20-21 due to a host of factors – low wind speed, cloud cover, moderate fog and drop in mercury, which together result in a toxic combination of smog.

The average wind speed on Monday was 18-20 kilometre per hour (kmph), which is favourable for dispersion. This is expected to reduce to 10-12 kmph on Tuesday and further to 4-6 kmph on Wednesday.

“High moisture content due to a fog cover traps pollutants while cloud cover bars sunlight from reaching the surface. Visibility in the morning hours may reduce to 300 metres. With a drop in temperature, the air becomes cold and heavy. Also, from Wednesday, the wind direction will also have an easterly component, which too brings moisture. All these factors can lead to accumulation of pollutants, which would not be dispersed if wind speed is low,” said Kuldeep Srivastava, head, regional weather forecasting centre, IMD.

In addition to this, the mercury will drop by two to three degrees Celsius on Wednesday, when the minimum temperature is expected to be around 12 degrees Celsius while the maximum temperature may settle at 24 degrees Celsius.

On Monday, the night temperature was recorded as 15.3 degrees Celsius, three notches above the season’s average, while the day temperature was 26.5 degrees Celsius, a notch below normal.

According to the bulletin released by the System of Air Quality and Weather Forecasting and Research (Safar), a unit of the union Ministry of Earth Sciences (MoES), the share of stubble burning to overall pollution in Delhi was 9% on Monday and it could rise up to 13% on Tuesday. It was much higher than 2% on Sunday. “Accumulation of pollutants leading to a sharp deterioration in air quality is predicted by November 20-21 when air quality may reach ‘severe’ category,” the forecast by Safar said.

**Diabetes (Navbharat Times: 20191119)**

# बीएचयू में तैयार हुई दवा, प्रयोग सफल रहा डायबिटीज रोगियों को घाव होने पर नहीं कटेंगे अंग

■ विकास पाठक, वाराणसी

काशी हिन्दू विश्वविद्यालय (बीएचयू) के इंस्टिट्यूट ऑफ मेडिकल सायेंसेज (आईएमएस) में एक ऐसी दवा तैयार हुई है, जो डायबिटीज के गंभीर रोगियों के संक्रमित घाव को ठीक कर देगी। ऐसे में रोगियों की जान बचाने के लिए हाथ-पांव काटने की नौबत नहीं आएगी। दवा का मुख्य बैक्टीरियोफॉज गंगा जल में मिलता है। चूहों और खरगोश पर सफल प्रयोग के बाद बीएचयू अस्पताल में इसका उपयोग घाव की ड्रेसिंग में किए जाने से कई मरीजों को लाभ मिला है। एंटीबायोटिक से ज्यादा ताकतवर बैक्टीरियोफॉज के मानवीय प्रयोग की अनुमति मिलने पर इसका इंजेक्शन और स्प्रे बाजार में उपलब्ध होगा।

बीएचयू के आईएमएस के माइक्रो बायोलॉजी विभाग में 2005 से बैक्टीरियोफॉज पर शोध चल रहा है। बैक्टीरियोफॉज के एंटीबायोटिक से कई गुना ज्यादा ताकतवर होने से बगैर दवा के इलाज की दिशा में भी तेजी से कदम बढ़े हैं।

डायबिटीज रोगियों को हाथ-पांव में घातक संक्रमण होने और एंटीबायोटिक दवाओं के बेअसर होने की स्थिति में प्रभावित अंग को काटना ही विकल्प होता है। लेकिन अब ऐसा नहीं होगा। गंगा जल में मिलने वाले बैक्टीरियोफॉज का संक्रमित घाव के बैक्टीरिया से कल्चर कराया जाता है। बैक्टीरिया का सफाया कर देने



गेंद ICMR के पाले में



माइक्रोबायोलॉजी विभाग के प्रोफेसर गोपालनाथ के मुताबिक, बैक्टीरियोफॉज से गंभीर रोगों के इलाज के अब तक हुए प्रयोग सफल रहे हैं। इसका इंजेक्शन और स्प्रे तैयार करने की अनुमति के लिए प्रस्ताव इंडियन काउंसिल ऑफ मेडिकल रिसर्च (आईसीएमआर) के पास विचाराधीन है। बैक्टीरियोफॉज के इंजेक्शन या फिर स्प्रे से खासकर सेप्टीसीमिया, गैंगरीन, फेफड़े की टीबी जैसी बीमारियों का कारगर इलाज संभव है। इतना ही नहीं मल्टी ड्रग रेजिस्टेंट के चलते मायकोबैक्टीरियम प्रजातियों से होने वाले रोग भी बैक्टीरियोफॉज से ठीक हो सकेंगे।

वाले बैक्टीरियोफॉज से ड्रेसिंग करने पर घाव जल्द पूरी तरह ठीक हो जाता है। अब तक करीब 35 मरीजों पर प्रयोग किया जा चुका है।

## फेफड़ों का कैंसर

**हथेलियों पर दिखाई दे ऐसा निशान तो हो सकता है फेफड़ों का कैंसर, शोधकर्ताओं ने बताया कारण (Dainik Jagran: 20191119)**

[https://www.onlymyhealth.com/velvety-triple-palms-could-be-a-sign-of-lung-cancer-in-hindi-1574139230?utm\\_source=Jagran&utm\\_medium=Referral&utm\\_campaign=Jagran\\_OMH](https://www.onlymyhealth.com/velvety-triple-palms-could-be-a-sign-of-lung-cancer-in-hindi-1574139230?utm_source=Jagran&utm_medium=Referral&utm_campaign=Jagran_OMH)

पिछले 30 वर्षों से रोजाना सिगरेट पी रही एक महिला की हथेलियों की त्वचा जब मखमली हो गई और ऊपर उठने लगेगी तो उसने त्वचा रोग विशेषज्ञ को दिखाया। रिपोर्ट में उसे फेफड़ों का कैंसर होने की बात सामने आई। ज्यादा जानकारी के लिए लेख पढ़ें।

ब्राजील की एक 73 वर्षीय महिला ने जब अपनी हथेलियों की खुरदुरी हुई त्वचा को लेकर त्वचा रोग विशेषज्ञ को दिखाया तो महिला में फेफड़ों का कैंसर (lung cancer) पाया गया। चिकित्सा के क्षेत्र में इस मामले को दुर्लभ बताया गया है। यह बुजुर्ग महिला पिछले 30 वर्षों से पूरे दिन में एक सिगरेट का पैक पीया करती थी, जिसके कारण इसे अपने हाथों पर दर्द महसूस होने लगा था, जिसके बाद महिला ने त्वचा रोग विशेषज्ञ को दिखाया, जिसमें उसे फेफड़ों का कैंसर होने की बात सामने आई।

द न्यू इंग्लैंड जर्नल ऑफ मेडिसिन में प्रकाशित इस मामले का हवाला देते हुए साइंस अलर्ट ने बताया कि उसे करीब एक साल से कफ आ रहा था और पिछले चार महीनों में उसका वजन करीब 5 किलोग्राम तक कम हो गया।

महिला की केस रिपोर्ट में उसके डॉक्टर ने बताया, "महिला की शारीरिक जांच से पता चला कि उसके हाथों की परत में पड़ी सिलवटों के अलावा मखमली सतह और त्वचा ऊपर उठ रही थी।"

मखमली हथेलियों को चिकित्सा क्षेत्र में एक दुर्लभ स्थिति बताया जाता है, जिसे 'ट्रिप्ली पाम' कहते हैं। यह गाय, सुअर और भेड़ के पेट पर पड़ी लकीरों की तरह प्रतीत होता है। कभी-कभार इसे एकेनथोसिस पामैरिस कहते हैं, यह स्थिति त्वचा विकार के अंतर्गत आती है।

73 वर्षीय इस महिला के केस में सीटी स्कैन से उनके फेफड़ों में अनियमितताएं पाई गईं। रिपोर्ट में कहा गया कि सीटी स्कैन के साथ बायोप्सी में ग्रंथिकैंसर (adenocarcinoma)की पुष्टि हुई और उसे कीमोथेरेपी और रेडियशन थेरेपी दी गई।

शोधकर्ताओं ने कहा, "ट्रिपी पाम वाले सभी रोगियों का अंदाजा लगाना पूर्ण निदान कार्य के साथ एक संबंधित विकृति के लिए किया जाना चाहिए, विशेष रूप से फेफड़े या गैस्ट्रिक कार्सिनोमा जैसे अंगों के लिए।"

## **Jaccha-Baccha Survey**

**Pregnant, nursing women's health: Himachal best, UP worst in survey (The Indian Express: 20191119)**

<https://indianexpress.com/article/explained/telling-numbers-pregnant-nursing-womens-health-himachal-best-up-worst-in-survey-6126303/>

Within the six states, which the survey divided into laggard and leader states, Uttar Pradesh, which is India's most populous, performed the worst, while Himachal Pradesh, on average, performed the best.

Special needs of pregnant women were widely ignored, the survey found. (Express Archive/Representation)

A new survey, called the Jaccha-Baccha Survey (JABS), conducted in June in six states (Chhattisgarh, Himachal Pradesh, Jharkhand, Madhya Pradesh, Odisha and Uttar Pradesh) to map the state of pregnant and nursing women has found that a high proportion of women do not eat enough during pregnancy.

The survey was conducted under the guidance of development economists Jean Dreze and Reetika Khera.

Within the six states, which the survey divided into laggard and leader states, Uttar Pradesh, which is India's most populous, performed the worst, while Himachal Pradesh, on average, performed the best.

UP also threw up the worst numbers on pregnant women not getting adequate rest — either because they had no one to help out at home, or because they had to actually go out and work on the farm in their condition.

The proportion of women who had to borrow or sell assets just to meet child delivery expenses too, was quite high, especially among the laggard states.

On access to basic healthcare facilities, the survey found that 36% women in UP did not get a single check-up at a primary health centre across different schemes.

The poor health of pregnant and nursing women, as well as inadequate healthcare infrastructure, lie at the heart of India's child nutrition crisis. The latest Global Hunger Index released in October pegged India at a lowly 102 out of a total of 117 countries. One of the key findings of GHI was that 'child wasting' (that is, children having low weight for their height) — which essentially shows the extent of acute malnutrition — had gone up over the past decade. At almost 21%, India's child wasting level is the highest in the world.

Combined with almost 38% of child stunting (that is, children who have low height for their age), India has the highest number of undernourished children in the world.

## **Healthcare**

### **India should work towards universal health care: Gates (Hindustan Times: 20191119)**

<https://epaper.hindustantimes.com/Home/ArticleView>

Report Niti Aayog says health system lagging comparable countries on some key indicators

New Delhi: : India's health care system has improved significantly over the past decade, Bill Gates, co-chair of the Bill & Melinda Gates Foundation, said on Monday, adding that the goal for India should now be to work towards universal health care and improving its primary healthcare system.

“As we look forward we need to remember that primary healthcare is very impactful,” Gates said at the launch of a Niti Aayog report on improving India's health care infrastructure.”Making sure that mothers, when they deliver, they are getting good attention and advice in the first 30 days about vaccines, breastfeeding and nutrition. That is very low cost and high impact. We need to make sure that primary health element is done very well.”

The report by the government policy think tank, titled Health System for a New India: Building Blocks-Potential Pathways to Reform, noted that India's health system was lagging behind those in comparable countries on many key performance indicators.

Gates suggested that the private sector be enlisted in the effort to improve the healthcare system. “Many countries have had a tough time with health systems,” he said. “The United States is not a perfect example of how to run a health system. We manage to spend more than

any other country and we don't get what you would expect for that. So, looking at other middle-income countries and seeing what they did well is really important in this report," he added.

To be sure, Niti Aayog clarified that it is not recommending a single-payer universal health care system in India. A single-payer health care system is a type of universal health care financed by taxes that covers the costs of essential health care for all residents with costs covered by a single public system.

"We are not recommending a single public system per se; as has been pointed out earlier, there are at least hundreds of financial pools which are already existing. One can't realistically expect that all these will be merged in a single pool at this time. There are single payer systems across the world but with the level of fragmentation we cannot expect it to happen realistically for the next 10-15 years ," said Alok Kumar, advisor (health) at Niti Aayog.

In the long run, there is a lot to be done at the federal and state level, Gates said.

The Niti Aayog report highlights the challenges plaguing India's underperforming health industry. India's health system is lagging behind comparable countries in many key performance indicators, it noted.

Fragmentation, understood as a myriad of organizations, institutions (formal and informal rules), management and administrative arrangements as well as entitlements that do not coordinate harmoniously and are often subjected to contradictory incentives, all hamper continuity of care and portability of benefits.

### **The mother of non-issues: on maternity entitlements (The Hindu: 20191119)**

<https://www.thehindu.com/opinion/lead/the-mother-of-non-issues-on-maternity-entitlements/article30009380.ece>

Rules and provisions on maternity entitlements have been brazenly violated and ignored for years, but who cares?

Sometimes I wonder what the world would be like if men, not women, were bearing and delivering babies. Quite likely, the maternity (oops, paternity) wards in hospitals would have the best equipment and doctors. The shelves of grocery shops would be filled with special food items for pregnant men. Women and children would be mobilised to attend to the needs

and wishes of the heroic lads who give birth. An array of new professions, products and technologies would develop to make their life easier, and pregnant men would also have free bus passes and separate queues. Further, paternity benefits would be given through flagship social programmes, with hefty budgets.

In contrast, maternity benefits in India are a non-issue. The Central government is clueless about their legal, financial and political aspects; as are the Opposition parties.

Maternity benefits, of course, are reasonably generous (by international standards) for a small minority of Indian women employed in the formal sector and covered, in principle at least, under the Maternity Benefit Act. The vast majority of pregnant women, however, are left to their own devices.

### Jaccha-Bachcha Survey

We had a telling glimpse of the hardships they face last summer, during the Jaccha-Baccha Survey (JABS), conducted with student volunteers in six States of north India — Chhattisgarh, Himachal Pradesh, Jharkhand, Madhya Pradesh, Odisha and Uttar Pradesh. For lack of knowledge or power, most of the sample households were unable to take care of the special needs of pregnancy, whether it was food, rest or health care. Among women who had delivered a baby in the preceding six months, only 31% said that they had eaten more nutritious food than usual during their pregnancy. Their average weight gain during pregnancy was just seven kg on average, compared with a norm of 13 kg to 18 kg for women with a low body-mass index. In Uttar Pradesh, 39% of the respondents had no clue whether they had gained weight during pregnancy, and 36% had gone through it without a health check-up. It is only in Himachal Pradesh, where rural women are relatively well-off, well-educated and self-confident, that the special needs of pregnancy received significant attention.

Maternity benefits could help to relieve these hardships and give babies a chance of good health. Under the National Food Security Act, 2013, all pregnant women (except those already receiving similar benefits under other laws) are entitled to maternity benefits of ₹6,000 per child. For more than three years, the Central government simply ignored its duty to act on this. Whenever the Supreme Court enquired about it, the government made false promises. Finally, on December 31, 2016, the Prime Minister proudly announced that pregnant women nationwide would soon be getting maternity benefits of ₹6,000. He said this without any reference to the NFSA, as if maternity benefits were an act of generosity on his part — perhaps to sweeten the demonetisation pill.

In pursuance of this announcement, a maternity benefit scheme was rolled out in 2017: the Pradhan Mantri Matru Vandana Yojana (PMMVY). The modalities of the scheme, however, violate the NFSA: benefits are restricted to the first living child, and to ₹5,000 per woman. A budget provision of ₹2,700 crore was made for it in the 2017-18 budget — a fraction of the ₹15,000 crore required for full-fledged implementation of maternity benefits as per NFSA norms. The actual expenditure was barely ₹2,000 crore; the allocation oddly reduced to ₹1,200 crore in the revised Budget of 2018-19.

## A damp squib

Until recently, little was known about the performance of PMMVY, but two helpful sources of information are now available: summary statistics obtained from the Ministry of Women and Child Development under the Right to Information Act, and the JABS survey.

According to the Ministry's response to our RTI query, 80 lakh women received at least one instalment of PMMVY money between April 1, 2018 and July 31, 2019, and 50 lakh received all three instalments. On a 12-month basis, this would correspond to 60 lakh and 37.5 lakh partial and full beneficiaries respectively in the Financial Year 2018-2019. Based on an estimated population of 134 crore and a birth rate of 20.2 per thousand (2017 estimates), the annual number of births in India would be around 270 lakh. Of these, a little less than half would be first births.

These figures imply that in 2018-19 only around 22% of all pregnant women received any PMMVY money, and around 14% received the full benefits. This scheme, in other words, is a damp squib.

The JABS survey suggests that PMMVY has been ruined in three steps. First, the coverage and benefits were reduced (compared with NFSA norms, which are very modest in the first place). This defused public demand for PMMVY. Had the benefits been higher and universal, the scheme would have been a hit. Second, the application process is tedious. Aside from filling a long form for each instalment, women have to submit a series of documents, including their 'mother-and-child protection' card, bank passbook, Aadhaar card and husband's Aadhaar card. Essential details in different documents have to match, and the bank account needs to be linked with Aadhaar. Had the government tried to discourage applications, it could not have done better. Third, there are frequent technical glitches in the online application and payment process. When an application is rejected, or returned with queries, the applicant may or may not get to know about it. Grievance redressal facilities are virtually non-existent.

Special mention must be made of Aadhaar-related problems. Some of them are replays of problems observed earlier with pensions, scholarships and the National Rural Employment Guarantee Act: for instance, rejected payments due to mismatch (say, in the spelling of the beneficiary's name) between a person's Aadhaar card and bank account. There are also new problems. For instance, more than 20% of the respondents mentioned that they had faced difficulties because the address on their Aadhaar card was that of their maika (parents' home), not of their sasural (in-laws' house). Why women are required to submit their Aadhaar card in the first place, let alone their husband's Aadhaar card, is far from clear.

## Examples of T.N., Odisha

Meanwhile, some State governments have put in place effective maternity benefit schemes of their own. One notable example is Tamil Nadu, the serial pioneer in the field of social security. Under the Dr. Muthulakshmi Reddy Maternity Benefit Scheme, pregnant women in Tamil Nadu receive financial assistance of ₹18,000 per child for the first two births, including

a nutrition kit. Odisha's Mamata scheme also covers two births, albeit with lower entitlements — ₹5,000 per child, as with the PMMVY. The JABS survey suggests that the Mamata scheme is working reasonably well: among women who had delivered in the last six months, 88% of those eligible for Mamata benefits had applied, and 75% had received at least one of the two instalments.

It would take very little to extend and consolidate these initiatives on a national basis. The Modi government, however, is not interested. Nor, it seems, are the Opposition parties: efforts to draw their attention to these issues earlier this year, in the run-up to the Lok Sabha elections, made little headway. Even the Congress Party, chief sponsor of the NFSA, did not mention maternity entitlements in its elaborate manifesto. If only men were the ones who give birth...

### **‘Maternity scheme reaches only one-third of beneficiaries’ (The Hindu: 20191119)**

<https://www.thehindu.com/news/national/maternity-scheme-reaches-only-one-third-of-beneficiaries/article30009783.ece>

Researchers assert that extrapolation of RTI data show 31% of eligible mothers got benefits.

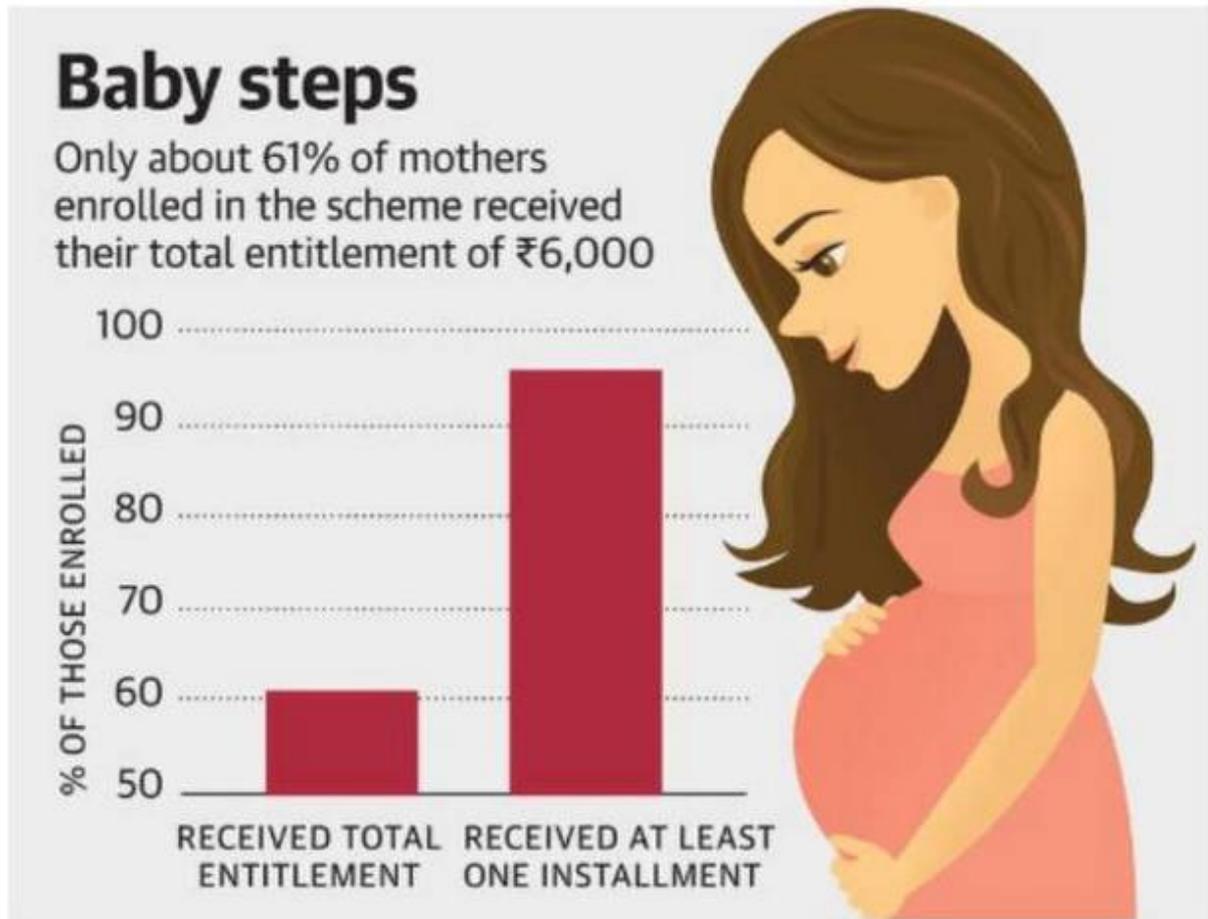
A vital programme to support lactating mothers and pregnant women by compensating them for loss of wages during their pregnancy has been able to reach less than a third of the eligible beneficiaries, researchers who extrapolated from data obtained under the Right to Information (RTI) Act said.

Almost 61% of beneficiaries registered under the Pradhan Mantri Matru Vandana Yojana (PMMVY) between April 2018 and July 2019 (38.3 lakh out of the total 62.8 lakh enrolled) received the full amount of ₹6,000 promised under the scheme, according to an RTI reply. However, the researchers, who are development economists, assert that since the scheme failed to reach at least 49% of all mothers who would have delivered their first child (an estimated total of 123 lakh for 2017 according to the researchers), the scheme was able to benefit only 31% of its intended beneficiaries.

The PMMVY is targeted only at women delivering their first child. A cash amount of ₹6,000 is transferred to the bank account of the beneficiary in three instalments upon meeting certain conditions including early registration of pregnancy, having at least one ante-natal check-up and registration of child birth.

## ‘Maternity scheme reaches only one-third of beneficiaries’

Given the stipulated conditions, the scheme brings under its ambit 23% of all births and pays full benefits to a mere 14% of all births, which was at 270.5 lakh for 2017. The meagre reach calculated is also an overestimate, asserts Ritika Khera, Assistant Professor, IIM Ahmedabad. The actual number of beneficiaries would have been higher for 2018-2019, she contends, as the figure increases from one year to the next.



The data extrapolated from the RTI reply is also consistent with a survey coordinated by three development economists Jean Dreze, Anmol Somanchi and Ms. Khera. The survey was conducted to assess the implementation of the scheme. The survey team covered a district each in six States — Chhattisgarh, Himachal Pradesh, Jharkhand, Madhya Pradesh, Uttar Pradesh and Odisha — in 2019 to interview women and inspect anganwadis. A total of 706 women were interviewed, including 342 pregnant and 364 lactating women.

### Inadequate awareness

The study found that only 50% of pregnant women and 57% of nursing women surveyed were eligible for the scheme. It also throws light on the need for higher awareness among the pool of beneficiaries — only 66% of pregnant women and 69% of nursing women knew about the scheme. Only 8% of pregnant women and 23% of nursing mothers received some benefits.

Several factors impeded proper implementation of the programme that aims to fight malnutrition among children. These include an application form of about 23 pages, a slew of documents such as mother-child protection card, Aadhaar card, husband's Aadhaar card and bank passbook aside from linking their bank accounts with Aadhaar.

The requirement to produce the husband's Aadhaar card results in excluding women who may be living with men they are not married to, single mothers and those who may be staying at their natal home. Women must also have the address of their marital home on their Aadhaar card, which often results in newly weds being either left out or forced to go from door-to-door when pregnant and needing rest and care.

Odisha, which decided to not implement PMMVY because it has its own State-sponsored scheme called 'Mamata' that includes two births, has a few lessons to offer through its near universal coverage. According to the survey, 95% of pregnant women and 89% of nursing mothers had been enrolled, the level of awareness was more than 90% among the two categories of women. However, there were long delays in transferring the cash amount to the beneficiaries resulting in only 35% of all women who were pregnant and 67% of all nursing women receiving some benefits.

The survey findings also highlight the need to pay greater attention to the special needs of pregnancy — good food, extra rest and health care. Only 22% of the nursing women surveyed reported that they had been eating more than usual during their pregnancy and the average weight gain was barely 7kg when it should be at least 13-18kg. Almost all the respondents had done household work regularly during their last pregnancy — 21% of nursing women said that they had no one to help them with domestic chores and 63% said that they had been working right until the day of delivery.

## **Malnutrition**

### **Odisha's strides in nutrition (The Hindu: 20191119)**

<https://www.thehindu.com/opinion/op-ed/odishas-strides-in-nutrition/article30010283.ece>

While health outcomes have greatly improved, tribal communities still lag behind

Odisha, which is one of the Empowered Action Group States, or eight socioeconomically backward States of India, has done remarkably well in health and nutrition outcomes over the past two decades. Its infant mortality rate has significantly declined. Its under-five mortality

rate almost halved in the National Family Health Survey (NFHS)-4 from NFHS-3. It has seen a steep decline in stunting in children under five. Anaemia in children and pregnant women has also decreased since NFHS-3. Antenatal care and institutional deliveries have shown good improvement. All these changes have been possible with financing, policy support, robust leadership, and innovations in delivery of services.

### Nutritional interventions

Nutrition has a strong correlation to health, and is integral to growth and development. Timely nutritional interventions of breastfeeding, age-appropriate complementary feeding, Vitamin A supplementation, and full immunisation are effective in improving nutrition outcomes in children. Odisha has performed better than other Empowered Action Group States in reducing undernutrition, and sets an example with its nutrition action plan calling for convergence with health, nutrition, and WASH (water, sanitation and hygiene) programmes. Odisha has taken a decisive step of decentralising the procurement of supplementary nutrition under the Integrated Child Development Services programme. This has led to fair access of services under the ICDS by all beneficiaries. This is evident from the rise in utilisation of services under the ICDS as compared to a decade ago. There has been a marked improvement in supplementary nutrition received by pregnant and lactating women in NFHS-4 compared to NFHS-3.

However, despite progress in child and maternal indicators, Odisha continues to be plagued by a high level of malnutrition. There is stark variability across districts in stunting ranging from as high as 47.5% in Subarnapur to a low of 15.3% in Cuttack. Wasting is high in 25 out of 30 districts. Almost half of the under-five children from tribal communities in Odisha are underweight, and 46% are stunted. The infant mortality rate among tribals is the fourth highest in Odisha, after Madhya Pradesh, Rajasthan and Chhattisgarh.

Supplementary food given under the ICDS programme has shown a significant increase. However, data show that less of such food is given as children grow older. There is also a decline in children receiving timely complementary feeding. Less than 10% of children receive a minimum acceptable diet. This can be attributed to a possible lack of understanding and awareness about nutrition due to illiteracy.

### Improving implementation

Another challenge for Odisha is in reaching out to remote and particularly vulnerable tribal groups. This could be the reason why tribal women and children are lagging behind the national average on nutrition and health indicators. It is essential to improve the implementation of schemes, and ensure last-mile delivery of nutrition services. A part of the solution lies in setting up mini Anganwadi centres catering to far-flung tribal hamlets. Raising awareness through community campaigns on the need for good nutrition would help improve utilisation of services by beneficiaries.

The International Food Policy Research Institute, in its research, called for inter-department engagements to accelerate the nutrition outcome in Odisha. There is a need to improve sanitation, women's education and underlying poverty, to be able to tackle undernutrition.

Underweight children should also be identified precisely so that the monitoring mechanism for improving service delivery can be strengthened. The National Nutrition Mission sets an example with its inter-ministerial convergence and real-time monitoring mechanism for tracking each beneficiary and tackling malnutrition.

## **Food Allergy**

### **New injection halts peanut allergy for at least 2 weeks (Medical News Today: 20191119)**

<https://www.medicalnewstoday.com/articles/327047.php#2>

The results of a new study suggest that a single injection of an antibody called etokimab may halt peanut allergy for at least 2 weeks.

The results of a new trial offer hope for fighting off peanut allergy.

Of the 15 participants with severe peanut allergy who took part in the small trial, 11 were able to eat about a nut's worth of peanut protein 15 days after the injection, with no allergic reaction.

Investigators at Stanford University in California carried out the trial. A recent JCI Insight paper gives a full account of their findings.

According to the team, the proof of concept study offers early evidence that the single antibody injection is safe and effective and ready for further testing in more extensive trials.

"What's great about this treatment as an option for food allergies," says senior study author Dr. Kari C. Nadeau, professor of both medicine and pediatrics at Stanford, "is that people did not have to eat the food to get desensitized."

The antibody injection could be a much needed, faster-acting alternative to oral immunotherapy.

With oral immunotherapy, people have to consume gradually increasing doses of the food that triggers their allergic reaction.

This method of desensitization, which requires clinical supervision at each dose, can take 6-12 months and carries the risk of an allergic reaction during that time.

Dr. Nadeau and colleagues explain that while the antibody treatment is still at the experimental stage, they hope that eventually, it will work for many food allergies and also for other allergic diseases.

Etokimab disrupts an immune system protein

A person has an allergic reaction when their immune system responds in an extreme way to allergens that are usually harmless to others.

Pollen and certain foods are the most common causes of allergic reactions. The reactions are not usually severe, but when they are, they can develop rapidly into anaphylaxis, which can be life threatening.

According to the National Institute of Allergy and Infectious Diseases, which is one of the National Institutes of Health (NIH), food allergy affects around 5% of children and 4% of adults in the United States.

However, in their study paper, Dr. Nadeau and colleagues cite recent research that puts these figures at 8% and 11%, respectively, with peanut allergy affecting 1–3% of the population and "associated with increased risk of severe anaphylactic reactions."

Etokimab works by interfering with interleukin-33 (IL-33), an immune system protein that has a significant role in health and disease.

IL-33 sets off a series of immune responses that result in allergic reactions. In people with allergies, it triggers antibodies called immunoglobulin E (IgE).

Activated IgE antibodies travel to immune cells that produce chemicals that cause allergic reactions.

These reactions typically give rise to symptoms such as itchiness in the mouth and throat, difficulty breathing, and potentially fatal anaphylactic shock.

There are different types of IgE antibodies, and each is specific to a particular antigen. A person with peanut allergy, for example, will only have IgE antibodies specific to peanut allergen. A person with several food allergies will have an IgE antibody for each of the food allergens that provokes an allergic reaction in their body.

The study results and next step

For the new study, the team "conducted a multicenter, randomized, double-blind, placebo-controlled phase 2a clinical trial in adults with peanut allergy."

There were 20 participants in total, all with severe peanut allergies. Of these, 15 received a single etokimab injection, while 5 received a single injection of placebo.

After 15 days, all participants tried consuming a small amount of peanut protein under clinical supervision.

Of those who received etokimab, 11 (73%) were able to eat 275 milligrams (mg) – or about one nut's worth – of peanut protein without experiencing an allergic reaction. None of the participants who received placebo were able to do this.

On day 45 of the trial, only some of the participants retook the peanut protein test. The authors explain that this was because "day 45 was part of the follow-up phase, [and] only a few participants returned to try to complete the day 45 food challenge."

At that point, 4 out of the 7 people (57%) in the etokimab group who took the food challenge passed, while again, nobody in the placebo group was able to.

"Those who reached the 275 mg threshold at day 45 had also reached this threshold at day 15," note the authors.

Other tests on day 15 also showed that participants in the etokimab group had less peanut-specific IgE antibodies and other immune markers in their blood than the placebo group. These results suggest that etokimab may alter a person's immune profile to one that produces a less allergic response.

None of the participants reported experiencing severe side effects during the trial.

"By inhibiting IL-33, we potentially inhibit features of all allergies, which is promising," Dr. Nadeau observes.

She and her colleagues say that the next stage should be to carry out larger and longer studies – with varying doses of etokimab – in people with food allergies.

"We were surprised how long the effects of the treatment lasted."

Dr. Kari C. Nadeau

## Heart Disease

### Exercise after the age of 60 may prevent heart disease, stroke (Medical News Today: 20191119)

<https://www.medicalnewstoday.com/articles/327021.php#1>

A study finds that increased activity over the age of 60 can significantly reduce the risk of cardiovascular disease.

In 2015, 900 million Trusted Source people, globally, were over the age of 60. By 2050, the World Health Organization (WHO) expect that number to reach 2 billion.

While it is common for people to become less active as age takes a toll on one's physical capabilities, a study just published in the European Heart Journal finds that either maintaining levels of activity or becoming more active at this stage of life is important for reducing the risks of heart attack and stroke.

The researchers found that study participants who reduced their levels of exercise over time had a 27% greater likelihood of developing heart and blood vessel issues. Those who became more active reduced their risk by as much as 11%.

Studying physical activity in older age

The authors of the study — led by Kyuwoong Kim, of the Department of Biomedical Sciences, at Seoul National University, in South Korea — analyzed data from 1,119,925 men and women 60 years or older.

The data had been collected by the National Health Insurance Service (NIHS), which provides healthcare to about 97% of South Korea's population. The average age of participants was 67, and 47% were men.

The NIHS conducted two health checks of the individuals, one in 2009–2010 and one in 2011–2012. The researchers collected data about these participants until 2016.

During each check, the healthcare providers asked the participants about their levels of physical activity and their lifestyles.

The researchers defined moderate physical activity as 30 minutes or more per day of dancing, gardening, or brisk walking. Twenty minutes or more of running, fast cycling, or aerobic exercise daily counted as vigorous exercise.

In their second NIHS health check, the participants reported how their levels of activity had changed since the first checkup.

A majority of the participants, about two-thirds, were inactive at the times of both checks. About 78% of women were physically inactive at the first health check, and this figure at the second check was roughly the same, at 77%.

Men were less inactive both times: 67% at the first screening and 66% at the second.

Just 22% of the overall group had increased their levels of activity between checks, while 54% of participants who had been exercising regularly five or more times per week had become inactive by the time of the second screening.

The researchers also analyzed national heart disease- and stroke-related medical claims and hospital records from January 2013 to December 2016.

By the end of the study period, 114,856 cases of heart disease or stroke had been reported among the cohort. The researchers adjusted for factors such as socioeconomic status, age, gender, other medical conditions, and lifestyle details such as smoking and alcohol use.

The study's analysis revealed that people who had increased their levels of activity from continuously inactive to moderately or vigorously active three to four times a week had lowered their risk of heart attack and stroke by 11%.

Those who had been active one or two times per week at the first check then increased to five or more times per week by the second check had lowered their risk by 10%.

People with disabilities also benefited from increasing their activity levels, reducing their risk of cardiovascular events by 16%. Participants with chronic conditions such as hypertension or diabetes saw a 4–7% reduction in their chances of experiencing a heart problem or stroke.

Meanwhile, the risk of cardiovascular problems had increased by 27% among participants who had reduced their levels of exercise between screenings.

"The most important message from this research is that older adults should increase or maintain their exercise frequency to prevent cardiovascular disease."

Kyuwoong Kim

"While older adults find it difficult to engage in regular physical activity as they age, our research suggests that it is necessary to be more physically active for cardiovascular health, and this is also true for people with disabilities and chronic health conditions," he continues.

There are some limitations to this study. First, it considered only older adults in South Korea, and the applicability of the findings to older populations in other areas cannot be assumed.

Second, it strongly relies on self-reporting of activity levels, and the findings depend on the accuracy of each individual's responses.

Finally, the NIHS questions did not encompass all forms of activity — for instance, the researchers did not include housework and other muscle-strengthening activities.

What to do with this information

Nonetheless, the study's conclusions present compelling evidence that exercise remains important as we age.

The findings make the case that physical activity should become a significant, daily priority for older adults as our bodies grow in fragility, and discomfort becomes more common.

Our health services could be doing more to encourage this idea, suggests Kim, adding, "We believe that community-based programs to encourage physical activity among older adults should be promoted by governments."

"Also, from a clinical perspective, physicians should 'prescribe' physical activity along with other recommended medical treatments for people with a high risk of cardiovascular disease."

Kyuwoong Kim

## **Infectious Disease**

### **The rise of superbugs: Facing the antibiotic resistance crisis (Medical News Today: 20191119)**

<https://www.medicalnewstoday.com/articles/327050.php#10>

While medical research has helped us overcome many health threats, we now face a new type of crisis: Many dangerous bacteria are becoming resistant to the drugs meant to fight them. Where do we go from here?

What is the state of the antibiotic resistance crisis? In this special feature, we investigate.

Healthcare professionals frequently use antibiotics to treat many forms of bacterial infection — from those that are mild to those that are potentially life threatening.

These bacteria-fighting drugs first became widely used in the early 20th century, though some medical historians argue that natural antibiotics featured in traditional therapies as early as 350–550 <sup>Trusted Source</sup>.

For the most part, antibiotics have proved to be a crucial ally in the fight for health, but over the past few years, these drugs have begun to lose their footing in their confrontation with bacteria.

This is because more and more bacterial strains are developing antibiotic resistance — they are no longer affected by the drugs that once suppressed their growth and activity.

This means that many bacteria have become more threatening because we have fewer means of offsetting them.

When a doctor finds that a bacterial infection is not responding to traditional antibiotic treatment, they are forced to use stronger, more aggressive antibiotics or antibiotic combinations — an increasingly restrictive approach that can also bring about unwanted effects on health.

So how did we get here, and are things quite as bad as they seem? More importantly, what can doctors, researchers, and the public do to address the ever-growing issue of antibiotic resistance?

A growing health crisis

Only last week, the Centers for Disease Control and Prevention (CDC) released a report Trusted Source reviewing the newest data on antibiotic resistance.

From the very first page, they make it clear that we are facing an important threat — the CDC dedicate this report to "the 48,700 families who lose a loved one each year to antibiotic resistance or *Clostridioides difficile*, and the countless healthcare providers, public health experts, innovators, and others who are fighting back with everything they have."

The situation is dire indeed: According to the newest data, more than 2.8 million people in the United States experience an infection from antibiotic resistant bacteria each year. Moreover, these "superbugs" cause 35,000 deaths per year in the country.

This threat is by no means new. It has persisted over the years, as Dr. Jesse Jacob — a specialist in bacteria resistant to multiple drugs, from the Emory Antibiotic Resistance Center at the Emory University School of Medicine, in Atlanta, GA — has told Medical News Today.

"[The] CDC released the first antibiotic resistance threat report in 2013, so this [situation] is not new," Dr. Jacob told us.

Although, he added, "Since the first report, the number of deaths due to these infections has declined [...] CDC has updated the estimated number of infections with antibiotic resistance per year from 2 million to nearly 3 million."

The fact that so many bacteria are not responding to first- or even second-line treatments means that people with these infections face much higher risks and poorer health outcomes.

"Antibiotic resistance has long been a problem, but the threats we face are real, immediate, and demand immediate action. Antibiotic resistance threatens modern medicine — our ability to safely perform routine surgeries and complicated organ transplants, as well as chemotherapy, all rely on the ability to prevent and treat infections."

Dr. Jesse Jacob

## Consistent antibiotic overuse

"Antibiotic resistance is not only a U.S. problem — it is a global crisis," the recent CDC report states. But what has led to this problem reaching a crisis point?

The answer to that question is complex, according to a review featured in the journal *Pharmacy and Therapeutics* Trusted Source. The first and perhaps most obvious cause of antibiotic resistance is the misuse and overuse of these drugs.

Some people mistakenly believe that taking any kind of antibiotics acts as a sort of panacea, and they use these drugs to treat illnesses such as influenza. However, antibiotics can only target and kill bacteria and thus only treat bacterial infections.

Antibiotics are powerless against influenza and other illnesses caused by viruses. So when someone takes antibiotics for the wrong illness or uses too many too often, this kills off helpful bacteria Trusted Source that populate the body, threatening the delicate balance upon which health depends.

Moreover, bacteria are naturally prone to evolve and mutate, and some bacterial strains have, over time, found ways to adapt so that certain antibiotics will not affect them.

When we take antibiotics at the wrong time or if we overuse them, this allows resistant bacteria to take over more easily — to spread and multiply, sometimes giving rise to further strains of antibiotic resistant bacteria.

In the U.S. and other countries around the world, pharmacies are not permitted to sell antibiotics to people who are unable to produce a prescription. Nevertheless, studies Trusted Source suggest that many people are still able to purchase these drugs without official recommendations from their doctors.

Additionally, some research has shown that doctors sometimes mistakenly prescribe antibiotics or prescribe the wrong type of antibiotic, which has likely contributed to the current health crisis.

According to one study paper, 30–60% of antibiotics that doctors prescribe to people in intensive care units are not necessary.

## Animals also factor in

It is not only humans who use antibiotics. While in some cases administering these drugs to animals is fully justified, recent studies have pointed out a problem when it comes to adding antibiotics to the food of farm animals destined for human consumption.

According to one recent study, Trusted Source "Of all antibiotics sold in the [U.S.], approximately 80% are sold for use in animal agriculture."

Farmers have resorted to such high rates of antibiotic use in animals to boost growth rates and prevent infections, which are more common among livestock due to ways that producers handle these animals for breeding or as a source of meat.

New research covered on MNT has found that antibiotic resistance is now on the rise in farm animals, too — and the rates are increasing fast.

This situation, some investigators believe, also contributes to the global antibiotic resistance crisis that affects humans.

"We need to better understand how antibiotic use in both humans and animals is related to growing antibiotic resistance — the concept is One Health, where the health of humans, animals, and plants [is] all linked and interdependent."

Dr. Jesse Jacob

What are the ways forward?

In the face of this growing threat, policymakers have been pushing for a more careful use of antibiotics in general, while researchers have been searching for treatments that could effectively fight antibiotic resistant bacteria.

"More and more studies suggest 'shorter is better,' in terms of how long to treat common infections, but we need more evidence for many of the more complicated infections," Dr. Jacob told us.

"We need research to find new drugs but can't rely on a pipeline of new drugs alone to solve this problem, since resistance eventually happens to all drugs."

Dr. Jacob also pointed to the need for better ways of determining which infections require antibiotics and when it is safe to start and stop this type of treatment.

"We also need to better understand nonantibiotic approaches to treat infections, including bacteriophages, vaccines, and antibodies," he added.

The team at Emory University has been working hard to find a way to use existing antibiotics more effectively in order to fight off superbugs. The research — to which Dr. Jacob contributed — has shown that it may be possible to fight certain drug resistant bacteria using specific antibiotic combinations.

Another recent study, from the University of California, Los Angeles, suggests that instead of using combinations of one or two antibiotics, as doctors typically do, healthcare professionals may want to use combinations of four or even five such drugs.

Study co-author Pamela Yeh, Ph.D., argues that combinations of multiple antibiotics "will work much better" than current strategies, when it comes to fighting superbugs.

New drugs vs. a more natural approach

Other researchers are on the lookout for new drugs, following a World Health Organization (WHO) report from 2017 that signaled a "serious lack of new antibiotics."

For example, a team of researchers from the University of Sheffield and the Rutherford Appleton Laboratory, in Didcot — both in the United Kingdom — started developing a new compound earlier this year that they hope will be able to effectively target bacteria, particularly strains of *Escherichia coli*, that are resistant to multiple drugs.

Other investigators are thinking further outside the box, working to harness the potential of bacteriophages, or bacteria-eating viruses. This is the case of a team from the University of Pittsburgh, in Pennsylvania, and the Howard Hughes Medical Institute, in Chevy Chase, MD.

These researchers report that they were able to successfully treat a severe liver infection in a 15-year-old using bacteriophages that ate the specific bacteria that had been causing serious harm.

Some researchers have turned their attention to probiotics, fighting bacteria with other bacteria.

Last year, specialists from the National Institute of Allergy and Infectious Diseases used *Bacillus*, a type of probiotic bacteria, to fight one of the most dangerous bacterial strains on the block: methicillin resistant *Staphylococcus aureus*, better known as MRSA. So far, their experiments in mouse models have yielded promising results.

And various scientists are looking for natural means of fighting superbugs. They suspect that compounds from plant-based sources could be just as, if not more, effective as antibiotics.

So far, researchers have cited green tea, cranberries, Persian shallots, and turmeric as potential sources of effective alternatives to antibiotics.

What we can do for now

For the time being, however, many specialists advise that the focus be on preventing infections from occurring. This, however, is more easily said than done.

The new report from the CDC lists antibiotic resistant *Acinetobacter*, *Candida auris*, *C. difficile*, and *Enterobacteriaceae* as some of the most urgent threats to health, according to recent data. The catch? All of these bacteria infect people who have recently received medical attention and who, usually, are still in the hospital.

"Some of these bacteria are carried by patients into the hospital, while others are acquired, in part due to otherwise lifesaving interventions, including antibiotic treatments and [other interventions involving] medical devices like intravenous catheters and mechanical ventilators," Dr. Jacob explained to MNT.

What, then, should doctors do? According to Dr. Jacob, "Healthcare professionals can prevent infections by cleaning their hands and following infection prevention practices, using

antibiotics appropriately (only when needed, for the minimum effective duration), vaccinating patients, and communicating between facilities to ensure awareness."

"Educating patients and families about these approaches is key," he added.

Regardless of how much care doctors take, however, dangerous bacteria may still prevail. A study from 2018 showed that many bacteria are becoming resistant to the alcohol-based disinfectants used in healthcare facilities.

And newer research, worryingly, has found that *C. difficile* appears to be resilient in the face of all hospital disinfectants.

Still, while we are faced with a serious threat, specialists maintain that prevention is possible — as long as individuals also do what they can to safeguard their own health. And the best way to do this is by listening to our physicians.

"Use antibiotics only when needed, especially not in 'just in case' scenarios," emphasized Dr. Jacob.

"Discuss the need for antibiotics with your provider. Clean your hands. Get appropriate vaccinations, which save lives and can prevent antibiotic resistant infections," he advised our readers.