The European Institute for the PCB Community

EIPC SPEeDNEWS

The Weekly On-Line Newsletter from the European Institute of Printed Circuits.
Issue 23– July 2021

NEWS FROM EIPC

It is with great sadness that we report the death of **Eugenio Panza.** Over the many years that EIPC have been holding their conferences, one figure always stood out as one of the most regular attendees. A consummate business professional, he was a true gentleman, on all fronts, and was held in high regard not only by his many loyal customers, who saw him as a reliable friend, but also his competitors in the industry who knew him to be a fair and principled man. His modest demeanour hid a depth of knowledge on many subjects, and he was always the best of company if you happened to be fortunate enough to be on his table at dinner. His great good humour always cheered the company. The PCB industry is in many way no different to all the others; they are staffed by people of talent and personality whose selfless commitment to the service of others over very many years makes them the success that they are and in this regard Eugenio Panza was a perfect example. He will be greatly missed.

EIPC send their sincere condolences to his wife and family.

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THE EUROPEAN PCB SURVEY

You will doubtless be aware that Mr. Michael Gasch from Data4PCB writes an annual PCB Industry Report. To this end he sends out questionnaires to all the PCB manufacturers in Europe and the returns represent 79% of the European production volume, and do not include traded PCB from outside Europe. It is the only publication that allows this insight.

We have been successful in obtaining a 10 % discount for our members, as for non-members the normal price is € 1250.

To give you an idea of the format that Mr Gasch uses we can send you the table of content, and a sample Report. Neither include forecasts nor data on individual companies, but the combination of the two provides a wealth of information, indeed one may liken it to having a Thesaurus on the desk of a writer. Printing and writing are close allies, so may we commend the purchase of this report to complement your own treasury of knowledge.

To obtain more information or your own personalised copy, please contact the EIPC office via email; eipc@eipc.org

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NEWS FROM BELGIUM

Ucamco

New Gerber Job Editor now accepts notes in Chinese

Gerber Job Editor, Ucamco's software that allows designers to create and edit job files that provide all essential PCB production data, has been significantly improved. The tool now accepts notes in Chinese. This is a huge milestone in the evolution of Gerber Job Editor, with clear advantages for the Chinese PCB market.

On top of the notes in Chinese, PCB production data in Gerber Job Editor can include a wide variety of essential specs, such as essential non-image based information, in a standard format that can be put into an automatic production flow.

The principal aim of Gerber Job Editor is to make life easier for electronics design and manufacturing professionals by facilitating clear, unequivocal communications prior to production.

Gerber Job Editor is 100% free of charge. It can be used regardless of your CAD system.
Download the software now via
https://www.ucamco.com/files/downloads/Gerber_Job_Editor_installer.zip

For further information, please contact:

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ELECTRONIC INDUSTRY NEWS

Apple says it might have to completely stop selling iPhones in the UK

By Jacob Siegal

Apple is no stranger to legal battles, but the latest fight could be one of its most dramatic of all time. Apple has threatened to exit the UK market if made to pay "commercially unacceptable" fees for alleged patent infringement. Optis Cellular Technology owns several wireless patents and regularly sues companies that infringe on these patents. Optis previously won $506 million from Apple in the US, but upon appeal, a federal judge overturned the ruling. In the latest patent lawsuit from Optis, Apple is on the hook for a whopping $7 billion.

Optis filed suit when Apple refused to pay license fees for using "standardized" smartphone technology in its products. In June, a High Court judge ruled that Apple infringed upon two Optis patents that help iPhones connect to 3G and 4G networks. In 2022, Apple faces a trial to decide how much it has to pay Optis for infringing on its patents.

Mr. Justice Meade is the High Court judge in charge of intellectual property. In January, he told Apple during a hearing that "it might be disappointed" by the rate the court set. Apple, in turn, threatened to leave the region altogether, freeing the company from the fine.
The judge was rather dubious about the likelihood of Apple leaving the UK altogether: "There is no evidence Apple is really going to say no [to paying the rate set by the judge], is there? There is no evidence it is even remotely possible Apple will leave the UK market?"

This was the response from Apple's lawyer, Marie Demetriou: "I am not sure that is right… Apple's position is it should indeed be able to reflect on the terms and decide whether commercially it is right to accept them or to leave the UK market. There may be terms that are set by the court which are just commercially unacceptable."

If Apple refuses to pay the fine, the High Court could ban it from selling iPhones in the UK. Meanwhile, Apple is threatening to stop selling its products in the UK over the patent lawsuit. Many experts have said this is the danger of allowing patent trolls to extort

money from companies by stockpiling patents. These companies amass troves of patents that they never intend to in commercial products. The intention, of course, is solely to sue other companies like Apple that actually offer products and services. Until the system changes, however, cases like this one will continue to arise over and over again.

DOE Announces $52.5 Million to Accelerate Progress in Clean Hydrogen

July 10, 2021 Editorial Staff

The U.S. Department of Energy has announced $52.5 million to fund 31 projects to advance next-generation clean hydrogen technologies and support DOE's recently announced Hydrogen Energy Earthshot initiative to reduce the cost and accelerate breakthroughs in the clean hydrogen sector.

The U.S. Department of Energy has announced $52.5 million to fund 31 projects to advance next-generation clean hydrogen technologies and support DOE's recently announced Hydrogen Energy Earthshot initiative to reduce the cost and accelerate breakthroughs in the clean hydrogen sector. Clean hydrogen is a form of renewable energy that—if made cheaper and easier to produce—can have a major role in supporting President Biden's commitment to tackling the climate crisis.

"Part of our path to a net-zero carbon future means investing in innovation to make clean energy sources like hydrogen more affordable and widely adopted so we can reach our goal of net-zero carbon emissions by 2050," said Secretary of Energy Jennifer M. Granholm. "These projects will put us one step closer to unlocking the scientific advancements needed to create a strong domestic supply chain and good-paying jobs in the emerging clean hydrogen industry."

Hydrogen is a clean fuel that—when combined with oxygen in a fuel cell—produces electricity with water and heat as by-products. Hydrogen can be produced from a variety of resources, such as natural gas, nuclear power, biomass, and renewable power like solar and wind. These qualities make it an attractive fuel option and input for transportation, electricity generation and industrial applications, such as in trucks, buildings, and manufacturing.

These 31 projects will focus on bridging technical gaps in hydrogen production, storage, distribution and utilization technologies, including fuel cells, thereby paving the way toward decarbonisation of the electricity sector by 2035 and creation of good-paying jobs across in the hydrogen sector.

"West Virginia University continues to utilize our state's vast natural gas resources to tackle some of the toughest challenges in industrial research, including by developing clean, innovative ways to produce hydrogen – a fuel that's increasingly important to our economy and has potential to decarbonise our energy systems, industrial processes, and the transportation sector," said U.S. Senator Joe Manchin, Chairman of the Senate Energy and Natural Resources Committee.

For More Information U.S. Department of Energy

Multitasking, Sensors Drive Smartphone Memory Requirements

5G networking is not the only driver making demands on NAND, DRAM

By Gary Hilson

Smartphone memory and storage requirements continue to be driven forward by 5G networking, but it's not the only trend putting pressure on mobile DRAM and flash.

Bigger bandwidth and faster speeds open the door for significantly large file sizes, including the adoption of 8K video. That nearly doubles the file size of video, said Itzik Gilboa, Western Digital's head of mobile segment marketing. The company recently announced its second-generation UFS 3.1 storage solution for 5G smartphones, the iNAND MC EU551. It's also aimed at supporting emerging applications such as gaming, augmented reality/virtual reality, and ultra-high-resolution cameras for burst mode photography. The new storage offering is the first to be built on Western Digital's UFS 3.1 platform, which leverages faster NAND along with a faster controller and improved firmware.

Today's smartphone is expected to ingest larger files much more quickly. Gilboa said the iNAND MC EU551 offers a 90% improvement in sequential writes compared to its predecessor. Not only does this enable smartphones to take advantage of 5G, but also the faster download speeds enabled by Wi-Fi 6. A 30% improvement in sequential reads lets applications launch faster with shorter boot-up time and enables faster upload speeds. Looking further into the future, Western Digital expects a new Wi-Fi standard beyond Wi-Fi 6 that will put even more pressure on memory and storage to handle bigger files faster.

8K video is already quickly becoming common on smartphones, getting transferred on and off to the cloud and even edited on the device, all of which drives NAND flash storage capacity and performance. (Image source: Western Digital)

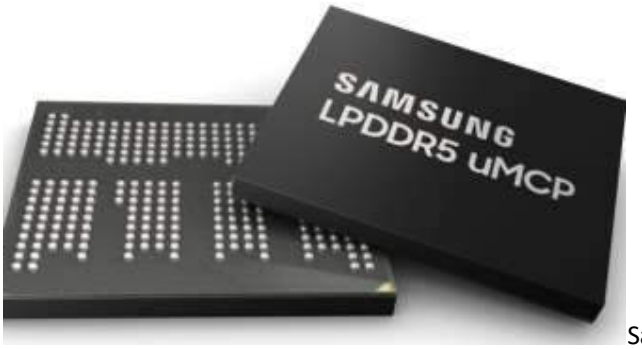
Much like the PC, smartphones are now expected to run multiple applications simultaneously, which iNAND MC EU551 supports with a 100% improvement in random read performance and up to 40% on random writes to support mixed workload experiences, said Gilboa. In addition, screen sizes are getting larger and resolution continues to climb to accommodate smartphones that are 8K video-capable because 5G handsets are becoming increasingly common. "We are at an inflection point where 5G is taking off," he said. "Most

flagship cell phones have 5G compatibility that's really driving the need for higher performance on our interfaces."

There's also an increasing number of different types of sensory devices that have been added to smartphone platforms, said Gilboa, including capacitive sensing, magnetic sensing and accelerometers to understand the phone's surrounding environment in new ways. "Applications that can take advantage of those sensory capabilities are just coming up." These will also drive more multitasking, he said, which will in turn drive latency requirements. The larger videos being captured on the smartphone may even get edited on the device, too, which will drive write requirements on the flash storage and will onboard artificial intelligence operations.

Gilboa said handset makers are looking at ways to distinguish their respective devices, and it's more than just advertising high-capacity storage to users. "They want to make sure we provide a seamless way to transition data in and out of the storage device." In some cases, he said, handset makers ask for unique features that enable them to control the data path under a variety of conditions so that path doesn't bottleneck the performance of the phone. "We're at a point where we're saturating the interface capability."

Western Digital's iNAND uses two proprietary features — its Write Booster, a buffering technology that increases sequential writes, and its host performance booster (HPB) 2.0 that contributes sequential write improvements of 90%, doubles random reads, and increases random writes by 40%. Gilboa said these capabilities are well beyond what emerging uses require today but will be normal a year and a half from now.



Samsung combines DRAM and NAND flash in a single package to save board space on the device for other features that improve user experience. (Image source: Samsung)

iNAND only addresses the storage needs of smartphones, while Samsung's approach is to provide both the flash storage and DRAM memory in a single UFS-based multichip package (uMCP), the latest of which integrates LPDDR5 DRAM with UFS 3.1 NAND flash to meet the needs of 5G smartphones throughout the mid- and high-end segments. The new uMCP measures 11.5mm x 13mm, allowing more space for other features with DRAM capacities ranging from 6GB to 12GB and storage options from 128GB to 512GB.

Stephen Lum, senior product marketing manager for consumer memory at Samsung Semiconductor, said fast speeds and high-capacity storage at low power are required for many 5G applications previously only available on premium flagship smartphone models as they move down to the midrange market —, such as advanced photography, graphics-intensive gaming, and AR. Compared to its LPDDR4X-based UFS 2.2 predecessor, Samsung's new uMC boasts a nearly 50% improvement in DRAM performance, from 17 gigabytes per

second (GB/s) to 25GB/s, and a doubling of NAND flash performance, from 1.5GB/s to 3GB/s.

While 5G is driving a great deal of the memory requirements in smartphones, advances in processors have always been a big driver for higher bandwidth, said Lum. “You don’t want the DRAM to be the bottleneck in the system.” HDR photography where multiple exposures are captured and amalgamated is an excellent example of an application that requires a lot of memory bandwidth, he said, as is gaming due to the high-resolution graphics.

The storage side must also keep up as network speeds get faster and more content, such as movies, are pulled down from the cloud for consumption — including 8K video — or sent up to the cloud because people are able to shoot and edit entire movies on their smartphone. Lum said AR/VR applications also require the high refresh rates that LPDDR5 enables to provide a good user experience in a virtual realm, as well as the bandwidth from UFS 3.1.

The amount of memory and storage on smartphones is rivaling desktop computers and the trend will continue as the amount of content grows in both volume and file size, said Lum. A package that combines DRAM and NAND flash allows performance and capacity to keep up while accounting for limited board space in mind. “Saving that board space is an enormous benefit for the smartphone OEMs. You have more space for other components or perhaps a larger battery to improve the overall device.”

Gary Hilson is a general contributing editor with a focus on memory and flash technologies for EE Times.

TECH

China’s tech crackdown has a new battleground — data

Arjun Kharpal@ARJUNKHARPAL

- *Chinese regulators ordered app stores in the country to remove ride-hailing service Didi on Sunday, alleging the company had engaged in the illegal collection and use of personal data.*
- *Authorities are turning their heads toward data regulation because of its importance to the technology industry, a key driver of economic growth.*
- *China passed a major data security law in June and is working on further regulation around individual data protection.*

GUANGZHOU, China — China’s government has opened a new battlefront with the country’s technology giants, looking to target their collection and use of data.

On Monday, the Cyberspace Administration of China (CAC) also opened a cybersecurity probe into U.S.-listed Boss Zhipin and subsidiaries of Full Truck Alliance.

It came a day after the CAC ordered app stores in the country to remove ride-hailing service Didi, alleging the company had engaged in the illegal collection and use of personal data. On Friday, the same regulator announced a cybersecurity review into Didi, which just last week carried out a massive initial public offering in the U.S.

The CAC reports to a body that is chaired by Chinese President Xi Jinping. Beijing has been cracking down on domestic technology giants over the last few months, from the cancellation of Ant Group's $34.5 billon listing to Alibaba's $2.8 billion antitrust fine. The focus has very much been on anti-monopoly as well as financial technology regulation.

Now regulators are turning their heads toward data because of its importance to the tech industry, a key driver of economic growth."You can't have a digital economy without strong data privacy protection. And the digital economy is propping up China's slowing growth," Kendra Schaefer, a partner at consultancy Trivium China, said.

China's technology giants have grown into some of the world's most valuable companies largely unchecked by regulation — but that's changing.Since the 2017 Cybersecurity Law, China has had some regulation around data. But in June, the Data Security Law was passed which defines the rules around how companies collect, store, process and transfer data. It comes into force in September.

A separate piece of legislation called the Personal Information Protection Law is also being worked on. If passed, it will give users more control over their data. "We can definitely expect to see a lot of user data crackdowns as soon as those two laws are passed," Schaefer said. "This is definitely another front (of regulation)."

The probes into Didi, Full Truck Alliance and Boss Zhipin are not under these new laws, but existing regulations. While the cases may seem sudden, regulators have been in touch with several technology companies around a number of issues including data regulation and anti-competitive practices.

In April, China's State Administration for Market Regulation (SAMR) summoned 34 companies including Tencent and ByteDance and told them to conduct self-inspections in order to comply with anti-trust rules.

"It started in April and they (the Chinese government) have given the companies over 100 items of compliance requirements covering many aspects, antitrust, data, advertisement, pricing, and lots of things," a lawyer that works with Chinese technology firms on compliance told CNBC.

"They (the government) have given them (the companies) so many instructions and clues asking them to improve their compliance system for all of those aspects," said the lawyer, who wished to remain anonymous due to the ongoing and sensitive nature of the compliance work.

The global shortage of chips is threatening the economic recovery

New figures show that UK GDP is slowing down. One of the red flags comes from the automotive industry, which is hit by a global shortage of semiconductors.

The manufacturing of transport equipment fell by a striking 16.5%, which was due to the shortage of microchips that power the electronics that make up most modern-day cars.

Image: Monty Rakusen / Getty Images

The impact of the global shortage of chips is starting to have a direct impact on economic growth: new figures show that the UK's GDP is stumbling, in part driven by cuts in the manufacturing of products that require semiconductors.

The Office for National Statistics (ONS) has published its latest measures of economic activity in the country, which show that GDP has grown by 0.8% in May 2021 – a boost mostly linked to the lifting of some COVID-19 restrictions, but which doesn't compare well to previous months, when the economy grew by up to 2.4%.

While many indicators seem to be in the green, with accommodation and food service activities growing by more than 37%, the manufacturing of transport equipment fell by a striking 16.5%, which the ONS said was due to the shortage of microchips that power the electronics that make up most modern-day cars.

Automotive companies have been struggling to get their hands on semiconductors for a few months now. The COVID-19 pandemic, in effect, drove up demand for electronic products like PCs and tablets that require large numbers of chips, and the handful of major semiconductor manufacturers that most companies rely on for supply have rapidly run out of sufficient capability to meet such heightened demand.

At the same time, the pandemic shut down vehicle factory lines, as governments implemented strict stay-at-home rules, meaning that car makers cancelled their semiconductor orders. Now that production has picked up again, therefore, automotive companies are finding themselves at the end of the queue for new chips, far behind higher-paying consumer electronics producers, and are facing huge lead times for the components they need to manufacture cars.

The issue is not UK-specific. Claus Vistesen, chief Eurozone economist at Pantheon Macroeconomics, explains that the trend has been spreading across most developed economies.

"In the automotive sector, at least in Europe, which is one of the areas where it is most prevalent, there is a big wedge that is driven between strong new orders and weak production," Vistesen tells ZDNet. "It suggests that automakers simply don't have the supply in key components they need for their products."

Leading car manufacturers in the UK and across the globe have drawn attention to the problem in their latest earnings reports. Jaguar Land Rover, for instance, highlighted a strong recovery in demand for vehicles that has been thwarted by a "difficult" shortage of semiconductors, which the company reckons will result on wholesale volumes about 50% lower than planned.

The firm previously had to temporarily shut down its two main car factories in the UK because of the lack of components, and was promptly followed by BMW, which suspended production at its Oxford Mini plant for three days.

Daimler has also acknowledged that the shortage of semiconductor components is affecting global deliveries, and expects the issues to continue to impact sales in the next two quarters. Volkswagen, for its part, anticipates that the bottleneck in semiconductors will affect the company in the second half of 2021.

Circumstances specific to the automotive industry mean that the sector has been particularly hardly hit, but economists forecast that the shortage is set to expand to many more products – and not only in transport.

"Transport equipment today, whether it is trains, cars, planes, or defence and security equipment, includes very technical software that requires semiconductors," says Vistesen. "In that respect, all kinds of high-end, high-value added manufacturing equipment could be hit by this, especially in the transport sector but also increasingly in industries like medical equipment."

And in consumer electronics, manufacturers are also preparing for delays in the production of items ranging from smart home equipment to basic household appliances like microwaves and refrigerators.

It is hard to tell when the supply of semiconductors will be sufficient to meet demand again. Vistesen expects the shortage to continue throughout the next two quarters, and some experts even believe that the crisis won't subside before well into 2022.

Ramping up the production of semiconductors seems to be the most obvious solution, and major chip manufacturers are already investing to expand their capacity. Governments,

too, are making pledges to increase the supply of components, with the Biden administration, for instance, committing a hefty $52 billion to boost chip making.

Despite those huge investments, chucking money at the semiconductor manufacturing industry is unlikely to resolve the immediate problem anytime soon. Building chip factories is a complex, time-consuming task – and new builds shouldn't be expected to start producing at least for the next two years.

"You can't snap your fingers and increase manufacturing," says Vistesen. "We have to assume it will be harder than we expect and it will take longer."

And as buying semiconductors gets ever-harder, Vistesen expects that companies will start hoarding the precious components to secure their supply chain. This could create a vicious circle in which access to chips is even more constrained, and although the trend, for now, is mostly anecdotal, the economist anticipates that it could aggravate the issue even further. For the automotive industry, therefore, the next few months are set to become even more challenging.

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PANDEMIC NEWS

Other nations are vaccinating children. Why isn't the UK?

WIRED

The UK is still considering whether to recommend vaccination for under-18s even though many countries have already decided the benefits outweigh the risks

In May 2021, Judith Guzman-Cottrill found herself facing a difficult decision. A paediatric infectious diseases physician at Oregon Health & Science University, she had just identified some of the earliest cases of myocarditis in adolescents who had received a Covid-19 vaccine.

The news was particularly concerning, as Guzman-Cottrill's own 13 year old daughter had just become eligible to receive a vaccination herself. "The first case at our hospital was in late April," she says. "But in May, I began to hear about a few more cases from infectious disease colleagues across the country. My daughter has a history of autoimmune illnesses, and I had to make a decision about her vaccine, so I was thinking about this from the doctor's standpoint, and also as a parent."

She set up a Zoom call with her colleagues, who had all witnessed the same trend – a small handful of otherwise healthy adolescent boys, aged 14-19, who developed sudden chest pains within a few days of their second vaccine dose.

But while these findings provoked some concern, Guzman-Cottrill's experience of treating children over the past 18 months meant she still concluded that the protective benefits of vaccination far outweighed any potential risks. After careful consideration, she agreed to let her daughter have the jab. "I've been taking care of children who have been hospitalised with Covid-19 since the beginning of the pandemic," she says. "And the numbers are much lower than adults, but it's certainly not zero."

In a microcosm, Guzman-Cottrill's dilemma encapsulates the one currently being faced by the UK's Joint Committee on Vaccination and Immunisation (JCVI). Right now only children deemed particularly vulnerable to Covid-19 – for example those with severe neurological impairments – are eligible for a vaccine, but with increasing numbers of nations across Europe rolling out vaccines to those aged 12 and over, the regulator is coming under pressure to follow suit.

Reports suggest that 20 European countries are either currently vaccinating 12-18 year olds or planning to do so in the very near future, alongside the UAE, Israel, Japan, Singapore, US, China, Canada, and the Philippines. "The recommendations are made by immunisation committees in each of these countries," says Beate Kampmann, director of the Vaccine Centre at the London School of Hygiene & Tropical Medicine. "It's driven by the dynamics of the epidemic in that country, political pressure and vaccine supply. The US has got tons of vaccines, so they have the ability to downscale the ages very quickly."

As well as protecting children themselves from the Sars-CoV-2 virus, one of the main goals of extending the vaccination campaign to younger age groups is to break transmission chains within households and schools. The sheer contagiousness of the new Delta variant means scientists are concerned that children could spread it to elderly relatives who may have not mounted a full immune response to their own vaccine, leaving them vulnerable. There have already been cases of so-called vaccine breakthrough infections - where fully vaccinated people become infected again with Covid-19 - in over 50s, suggesting that their immune response has waned.

There is already evidence in some countries that have already rolled out the vaccine to younger age groups, that this can help lower transmission rates. In Israel, who began vaccinating 16-18 year olds last December, infection rates have plummeted from 559 cases per 100,000 people in mid January, to 1.5 per 100,000 today, with rates also dropping in unvaccinated children.

"Now we have this Delta variant, I think we're definitely going to be seeing an increase in transmission this coming autumn and winter, as kids go back to the classroom," says Guzman-Cottrill. "I see it as kind of a race against the calendar to vaccinate children before then, when seasons change and everyone goes back indoors."

But while vaccines remain society's most powerful defensive weapon against the coronavirus, other scientists emphasise that the risk/benefit ratio of inoculating the young does need to be carefully assessed. Children's bodies are sensitive, and differ at varying stages of development, meaning the jabs may need to be adapted to suit their needs. In particular, the juvenile immune system can react more vigorously to vaccines, leading to

side effects which may not be present in adults. It is this which is thought to be behind the cases of heart inflammation, and as a result some scientists have broached the idea of either giving children only one shot instead of two or reducing the dose. However so far, neither concept has been thoroughly tested.

“The younger you are, the higher chance you have of having more reactogenicity to the vaccine,” says Guzman-Cottrill. “So more fever, more chills, more muscle aches, as well as other side effects.”

As a result, the JCVI has been cautiously observing the safety data emerging from around the world as other countries roll out the vaccine in 12-18 year olds, before coming to its own decision. “You need to take safety extremely, extremely seriously to make sure that there isn't anything else untoward emerging,” Kampmann says. “Until we've got a safety database that is sufficient for JCVI, for making informed recommendations, it is also a question of prioritisation, which is why planning the booster shots campaign took precedence over organising anything for the children.”

Most of the safety data we have on how the vaccine performs in children comes from the US where the Pfizer vaccine was approved for use in 16-18 year olds last December, before being rolled out to 12-15 year olds in May. Sonja Rasmussen, professor of paediatrics and epidemiology at the University of Florida, is adamant that the benefit outweighs any risks of vaccine side effects, pointing to how the proportion of Covid-19 cases in children have risen in recent months.

“We know kids aren't as severely affected by Covid-19 as adults, but that doesn't mean they don't have any effect,” she says. “Over 300 kids have died in the US since Covid started, and a lot have been hospitalised. Now the proportion of new infections that are made up by kids is increasing a lot, from about two per cent in March 2020, to around 24 per cent at the moment.”

So far the US Centres for Disease Control and Prevention (CDC) has confirmed 594 cases of vaccine-related myocarditis in under 30s, including 12-18 year olds, but Rasmussen points out that the incidence remains very rare. More than six million 12-18 year olds across the US have now received the vaccine, and most myocarditis cases rapidly resolve after a few days of anti-inflammatory treatment. A recent analysis from the CDC also estimated that for every million second dose vaccinations of children aged 12-17 over 120 days, there are somewhere between 64 and 79 cases of myocarditis. But these vaccinations prevent an estimated 14,200 cases of Covid-19, which would normally result in 398 hospitalisations, 109 intensive care admissions, and 3 deaths.

“I think for kids above the age of 12, we have really good data right now that the benefit of the vaccine is worth the risk,” says Rasmussen. “I do think right now parents need to be thinking, ‘Do I want my kid to get the vaccine? Or do I want my kid to get Covid-19?’”

While children are less vulnerable to Covid-19 than adults, there are some very real risks. It is hoped that vaccinations will protect children from Multisystem Inflammatory Syndrome (MIS-C), a serious condition which begins a few weeks after an acute Covid-19 infection, and affects around 1 in 5,000 children, particularly people from Black, Asian or ethnic minority backgrounds. There is also increasing evidence that children of all ages are vulnerable to Long Covid. John Warner, a professor of paediatrics at Imperial College, London, has been working with the StopCOVID Research Team at Sechenov First Moscow State Medical University on a study attempting to assess the prevalence of Long Covid in different age groups.

Out of 518 children aged between zero and 18, who tested positive for Covid-19, they found that 24.3 per cent were still suffering from persistent symptoms ranging from fatigue to allergic reactions, some five months later, with 12-18 year olds proving particularly vulnerable. “These are children not necessarily admitted to hospital,” says Warner. “These are children with mild and sometimes even asymptomatic infection who have just been picked up because they were contacts of a known case. So it's a considerable burden.”

While teenagers appear to be most susceptible to Long Covid, it can also be seen in even younger children. According to the Office of National Statistics, it occurs in 7.4 per cent of children between two and 11, who have tested positive for the virus.

As a result, while the JCVI is still deliberating over vaccinating 12-18 year olds, other countries are contemplating the prospect of rolling out the jab later this year to even younger children. At the moment, none of the Covid-19 vaccines have been approved for use in under 12s, but both Pfizer and Moderna are currently conducting clinical trials in this age group, with the results anticipated in the next few months.

Guzman-Cottrill says that for many children, vaccination could represent a path back to a more normal life. “This pandemic has been really mentally challenging for children from a mental health perspective,” she says. “It has really taken a toll on their mental health, with the isolation, and the inability to do whatever it is that they love. We have to consider that as well.”

Here's what we know about children and long Covid

Children who contract covid-19 can have symptoms that persist for weeks or even months, but it's not clear how frequently this occurs or which children are at risk.

By Cassandra Willyard.

When it comes to Covid, children have largely been spared. They can get infected and spread the virus, but they have little risk of becoming seriously ill or dying. Yet, just like adults, they can have symptoms that persist well beyond the initial infection. This condition, officially known as post-acute sequelae of SARS-CoV-2 infection (PASC), is often referred to as "long" Covid.

It needs to be taken seriously, says Alok Patel, a pediatrician at Lucile Packard Children's Hospital Stanford. "Even though even though Covid itself—the acute infection—presented less severe in children, long Covid is very debilitating, isolating and scary for families."

Why are we talking about this now?

Vaccination is changing the demographics of the pandemic. As more adults get vaccinated, kids and young adults represent a growing proportion of cases. The absolute number of cases among children is still lower than it was at the height of the pandemic, but the infection rates in children have not fallen as fast as they have in adults.

That makes sense. With the virus still circulating, "it's going to hit the people that are most vulnerable, which are the people that haven't been vaccinated," Sean O'Leary, vice chair of the AAP's Committee on Infectious Diseases told NPR. Kids under 12 aren't yet eligible for vaccination, and younger people who can get the shot have some of the lowest vaccination rates in the United States. "There has been a lot of focus on these post-Covid symptoms in adults," says Patel. But "we haven't had the type of robust data we really need in the paediatric population." That's slowly starting to change.

How common is long Covid in children?

That's the problem—we just don't know. "There's just a dearth of good, peer-reviewed published medical literature on this topic," says Alicia Johnston, an infectious disease specialist and head of the new post-Covid clinic at Boston Children's Hospital. And the handful of studies that do exist report wildly different rates.

For example, researchers in Italy surveyed caregivers of 109 kids who had been infected and found that 42% of the children had at least one symptom two months after their diagnosis. Four months out, the number dropped to 27%.

But data from the UK's Office of National Statistics suggest that just 10-13% of kids who test positive for Covid have symptoms more for than five weeks. And 7-8% has symptoms beyond 12 weeks. That matches an Australian study, which examined 151 young children with Covid and found that 8% still reported symptoms three to six months after infection. All of the kids have since recovered.

One non-peer reviewed study tracked symptoms among more than 1,700 school-age children in the UK who tested positive for SARS-CoV-2. Of those, 4.4% had symptoms that lasted more than a month. And only 1.8% had symptoms that persisted longer than two months.

Another preprint paper from Switzerland compared long Covid symptoms in two groups of kids between the ages of 6 and 16: those who had antibodies against SARS-CoV-2 and those who didn't (and presumably had not been infected). The percentage of Covid-positive children reporting at least one symptom ranged from 9% at four weeks to 4% at twelve weeks. But surprisingly, the researchers found similar rates of symptoms among those who tested negative for antibodies.

What causes long Covid?

Researchers don't know why symptoms persist in some children and adults. These lingering effects could be the result of organ damage caused by the virus. Or perhaps viral proteins left in the body are triggering chronic inflammation. Some scientists speculate that there may be virus still replicating at very low levels. What we do know is that lingering symptoms aren't unique to Covid. Other viruses can cause post-infection syndromes too. But it's often difficult to tease out whether the symptoms are directly caused by Covid or whether they're indirectly related, Patel says. Pandemic-related stress and societal changes such as school closures and social distancing can have profound impacts on kids' mental health.

What are the symptoms?

Long Covid symptoms in kids mirror those seen in adults: fatigue, muscle and joint pain, headache, loss of taste or smell, respiratory problems, chest tightness or pain, and heart palpitations. "We've seen a number of kids who are complaining of just really persistent ongoing headaches, brain fog, and concentration issues," says Johnston.

Slack groups and social media are connecting people who've never fully recovered from coronavirus to collect data on their condition.

Who is at risk?

Again, researchers don't have good answers. Some data suggest that older kids are at greater risk of developing long Covid than younger kids. But other risk factors remain elusive. For example, there's no compelling evidence that the severity of the initial illness affects risk. "Many of the kids who are complaining of long Covid either had very mild disease or they were completely asymptomatic," Johnston says.

There's also no clear link to underlying conditions that might predispose someone to develop long Covid. If doctors knew which kids had the highest risk "perhaps there's something preventative that we could do," Johnston says. "Some of these kids have been suffering for many, many months before they eventually get to our clinic."

How is long Covid diagnosed and treated?

There's no test for long Covid. Doctors listen to a patient's history, document their symptoms, and assess whether they were previously infected with SARS-CoV-2 to make a clinical diagnosis. And since nobody knows what causes long Covid, doctors can't cure it. The best they can do is treat the symptoms. A handful of clinics have created special long Covid units specifically aimed at treating children with the condition.

Will vaccination curb long Covid symptoms?

Possibly. There have been many anecdotal reports suggesting that vaccination can help. And a survey of 900 people in the UK found that vaccination improved the severity of symptoms in 57% of participants. (Just fewer than 7% experienced a worsening of their symptoms.) Some immunologists hypothesize that the vaccines might be able to eliminate any remaining virus or viral detritus. But there is no data yet specific to children.

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