

INFLUENZA | 2018-19 in review...



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Influenza remains one of the world's greatest public health challenges. Every year across the globe, there are an estimated one billion cases, of which three to five million are severe cases, resulting in 290,000 to 650,000 influenza-related respiratory deaths.

The current flu season is just about over in the northern hemisphere, and it has been much less harsh than those of recent years. There have still been an unusually high number of deaths, though not anywhere near the scale of the flu season of 2017-18 which was one of the most deadly seasonal influenza outbreaks for decades. In the United States, for example, there have been between 9,000 and 16,000 flu-related deaths this winter - by comparison, flu killed about 80,000 people there last year.

The seasonal flu vaccine is individually tailored for the northern and southern hemispheres each year to best match the suspected prevalent flu strains at the start of the season. It reduces flu illness and hospitalisations, protects pregnant women during and after pregnancy, and is lifesaving in children. For older people with chronic health conditions, getting a 'flu shot' is as effective in preventing a heart attack as quitting smoking, taking cholesterol-lowering drugs or taking blood pressure medications, recent studies show.

How we measure the response to the flu vaccine is in the percentage reduction in three parameters: illness, hospitalisation and deaths. The group in which the vaccine has been most effective this season is the 'under-five year old population'. In older adults there has been a much less significant effect - this is down to the particular strain of flu that has been prevalent, mainly affecting children. In a season where the vaccine has a good match with the predominantly circulating strains, the flu vaccine can reach 60% effectiveness. The Centers

for Disease Control (CDC) in the US has calculated that this season's vaccine has been about 47% effective - last year's was much less effective with only a 40% reduction in cases.

The MMR vaccine, out of interest, is around 97% effective with the standard two doses!

Last month (March 2019), the World Health Organisation (WHO) launched a revised "*Global Health Strategy 2019-30*" proposing measures to protect people in all countries from the threat of flu for the next 11 years. There are three main goals of the strategy:

- ▣ To prevent seasonal influenza
- ▣ To control animal-to-human spread of the virus
- ▣ To prepare for the next pandemic - an ever-present, inevitable threat

The only way to achieve these aims is for every country in the world to develop a tailored programme for surveillance and response, while scientists continue to develop tools for better detection, prevention and treatment, that are then made available to all of these countries.

WHO recommends annual influenza vaccination as the most effective way to prevent influenza. Vaccination is especially important for people at higher risk of serious influenza complications and for health care workers.

POLIO | Two polio cases identified in Indonesia

Indonesia, an archipelago consisting of 17,000 islands, has recently reported its first cases of polio for over a decade. The two cases so far identified are genetically linked and are 'vaccine-derived'. This is an indication that there is low general vaccination status in the country. It is important that there is now a concerted campaign to significantly increase vaccination coverage to prevent further spread. These cases are separate to the unrelated cases in neighbouring Papua New Guinea. A separate outbreak of vaccine-derived polio in Syria has been successfully controlled with no international spread, and Syria is no longer considered to be an active outbreak area. However, it remains vulnerable, especially with security concerns preventing vaccination teams from reaching vulnerable children.

There are two ways of contracting polio in the community:

- ❏ **Wild polio virus** - only three countries still harbour polio virus in the 'wild' (Afghanistan, Pakistan and Nigeria) - there were only 33 reported cases in 2018
- ❏ **Vaccine-derived polio** - outbreaks can occur in very rare circumstances where the oral polio vaccine (OPV) is used.

In countries where OPV is administered, the weakened vaccine-virus replicates in the intestine for a limited period. During this time the vaccine-virus is also excreted and, in areas of inadequate sanitation with seriously under-immunised communities, the virus can begin to circulate - this

can offer protection for other children through passive immunity. However, if it remains for an extended period, for a year perhaps, it can genetically mutate into a form that can cause classic polio paralysis.

Since 2000, more than ten billion doses of OPV have been administered to nearly three billion children worldwide. As a result, more than 13 million cases of polio have been prevented, and the disease has been reduced by more than 99%. During that time, 24 outbreaks occurred in 21 countries, resulting in fewer than 760 cases of vaccine-derived polio. These numbers are very, very small in the context of eradicating the disease and polio outbreaks only occur in situations of severe under-immunisation, but in the communities where they occur there can be a very negative perception of the vaccine - intensive education is needed.

Polio mainly affects children under five years of age. There is no cure for polio, it can only be prevented. Polio vaccine, given multiple times, can protect a child for life.

If you are travelling to Indonesia or other countries reporting recent vaccine-derived polio virus, you should make sure you have completed a full course of a polio-containing vaccine. Vaccines used in the UK/US/Western Europe/Australasia etc, will provide protection against all types of polio. If your last dose of polio vaccine was given ten or more years ago, you should have a booster dose.



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The risk of international spread of polio virus continues to constitute a Public Health Emergency of International Concern.

ANTI-VACCINATION MOVEMENT | One of the ten biggest threats to global health in 2019*

*According to the World Health Organisation



In recent months there have been numerous reports from around the world on the harmful effects of the “*anti-vaxxers*”, or the anti-vaccination movement. Social media influencers and high profile celebrities, endorsing the message against vaccinations, are gaining an increasing following among the general public causing a resurgence in infectious disease outbreaks, some of which were previously close to eradication.

The WHO has identified ‘vaccine hesitancy’ as one of the most dangerous threats to global health, citing for example a recent 50% increase in the number of cases of measles reported worldwide.

From 1st January to 21st March this year, 314 cases of measles were reported in the US by the CDC. This is up from 372 in the whole of 2018. The cases reported were primarily unvaccinated children. It should be understood that the decision to leave a child unvaccinated is not just a threat to the individual, but also affects the “herd immunity” - the overall resistance among any given population to a disease. It offers protection for people without full immunity, like newborns and those with immunosuppression from transplants or chemotherapy, for example.



Herd immunity occurs when most people in the population are vaccinated.

When a high percentage of the population is vaccinated, it becomes difficult for diseases to spread because there are not many people who can become infected. This gives protection to those that are vulnerable.



There are many examples of tougher action being taken around the world, to combat the increase of outbreaks:

- In Wisconsin, USA, a husband and wife have both been charged with one misdemeanour account of endangering the public after the wife helped her husband violate a 'measles quarantine' so that he could go to the gym.
- In Rockland County, New York, authorities have taken the drastic measure to ban unvaccinated people from public spaces, in the light of a local measles outbreak. Rockland County had previously banned unvaccinated children from attending schools, but the new measure is the most aggressive move yet.
- The Italian parliament has issued a ruling to ban children who are not vaccinated against measles from schools. The decision follows months of national debate over compulsory vaccination. Parents risk being fined up to €500 if they send their unvaccinated children to school and children under six can be turned away if there is no proof that they have been vaccinated.
- In Oregon, a boy was hospitalised for two months, resulting in a hospital bill of almost one million dollars, after contracting tetanus from a deep laceration to his forehead. He was stitched up at home after injuring himself playing, but six days later he began clenching his jaw, arching his back and had uncontrollable muscle spasms. When he began having trouble breathing his parents called for a paramedic and he was airlifted to Oregon Health and Science University Hospital in Portland. His parents reportedly turned down the second dose of the vaccination after he recovered along with all other routine childhood vaccinations. Not only has there been a drop in the overall percentage of unvaccinated children and adults worldwide, there has also been a spike in the number of people refusing to vaccinate their pets against deadly diseases. This may not sound too concerning but this does include vaccinations against diseases that can be transmitted to humans including rabies in countries where rabies is endemic.

The campaign against vaccinations gathered momentum in 1998, when a now infamous study by a British doctor named Andrew Wakefield incorrectly linked the MMR (measles, mumps, rubella) vaccine to autism. His research has since been completely discredited, but the theory has endured within the global anti-vaccination community. Mr Wakefield who has since been struck off the UK medical register made the claim based on the experience of just 12 children with results that no other study since has been able to replicate.

A new Danish research study was released on 5th March. The study followed 650,000 children and categorically concludes that MMR **does not** increase the risk of autism or trigger it in those susceptible.

We can however end on a positive note after an isolated indigenous tribe in Brazil's remote Amazon rainforest was successfully vaccinated after concerns that contact with other tribes and the outside world would leave them vulnerable to viral infections to which they have no immunity.

The expedition of 30 people, including medical professionals, took over a week to find the isolated tribe in *Korubo Village* and managed to persuade all 34 tribespeople to be vaccinated against measles and influenza which could otherwise prove fatal to indigenous people with no immunity.



CYCLONE IDAI | The threat of disease in affected areas of Mozambique and Zimbabwe

During the night on March 15th, Cyclone Idai made landfall as winds of greater than 200km/hr struck the Mozambique coastal town of Beira and swept down the coast to the mountains of Zimbabwe and into neighbouring Malawi, though to a much lesser extent. Immense volumes of rainwater were dumped on the land and winds tore down habitations, trees, bridges and roads. Entire communities were cut off. Mudslides caused further devastation and hundreds of people have been confirmed dead. Many thousands are missing and hundreds of thousands have been displaced. The rains continued for days, hampering rescue attempts and preventing the needed influx of supplies and medication.

One of the main priorities of governments, aid agencies and medical personnel is to establish a supply of clean water, water purification tablets, oral rehydration salts and nutrition, health and hygiene supplies. There is very little time to prevent the spread of diseases. Current conditions – stagnant waters, lack of hygiene and overcrowding in temporary shelters – can easily lead to outbreaks of diarrhoea, malaria, typhoid and cholera - to which children are especially vulnerable.

The impact on infectious diseases is already being felt. At least five deaths from cholera have been confirmed by Mozambique authorities, from over two thousand cases, in the cyclone-ravaged city of Beira. It is a major concern for hundreds of thousands of survivors living without clean water and sanitation. Cholera is spread by contaminated food and water and can be fatal within hours. Aid organisations have provided nearly a million vaccinations that are being urgently dispensed for those at greatest need.

The scale of extreme damage will likely lead to a dramatic increase of waterborne diseases and vector-borne diseases, such as malaria, over the coming weeks. Mosquito nets are on the way but the extent of stagnant water breeding grounds for mosquitoes is likely to lead to a significant spike in cases of malaria in the region. Strengthening of preventive healthcare services is critical in the coming days to avert and / or quickly respond to potential outbreaks of communicable diseases.



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The United Nations is estimating that Cyclone Idai may be the deadliest natural disaster to hit the southern hemisphere.

NEWS IN BRIEF | Round-up of other medical news stories

LASSA FEVER IN NIGERIA

The Nigerian health authorities have reported a total of over 2,000 suspected cases of Lassa Fever in the first three months of 2019. Of these, 526 confirmed positive with 121 deaths - that is a case fatality ratio (the percentage of cases that die) of almost a quarter of all confirmed cases. There have been cases reported in 21 states but the majority have been in the southwest states of Edo and Ondo. Lagos has remained free of disease.

Lassa fever is known to be endemic in **Nigeria**, with peak season between December and June, but this outbreak is more severe than in recent years. Lassa fever is a viral haemorrhagic fever that is transmitted to humans via contact with food or household items contaminated with rodent urine or faeces. Person-to-person infections can also occur through nasal transmission, with 12 confirmed cases among healthcare workers. There is currently no approved vaccine. Early supportive care with rehydration and symptomatic treatment improves survival.

ZIKA TRAVEL RECOMMENDATIONS FOR AT-RISK WOMEN

Following recent changes in recommendations, by the CDC and the Public Health England, for 'at-risk women' (pregnant women and those 'looking to conceive'), the World Health Organisation (WHO) is poised to relax its own **Zika** travel recommendations in the coming weeks.

In January 2016, the WHO declared Zika a global health emergency and at its peak there were warnings for at-risk women to avoid 88 countries. The new recommendations will only seek to discourage travel by at-risk women to areas with active outbreaks, of which there is currently only one, in **Rajasthan**, India. For all other countries in which the virus has been reported in recent years, the agencies will recommend that at-risk women should consult their health professionals and the countries' own health ministries.

The problem with providing recommendations is that Zika has fallen below the radar in many countries that don't have routine surveillance. Without solid data it is hard to say whether or not Zika is still around. Consequently, unless there is an active outbreak, it will be left to the individual to decide whether or not they want to take the risk.

EBOLA IN THE DEMOCRATIC REPUBLIC OF CONGO

The **Ebola Virus Disease** (EVD) outbreak in the **Democratic Republic of Congo** continues but is beginning to trend downwards from the peak of cases in January. The authorities in the North Kivu and Ituri provinces, near the border with Uganda, have managed to contain the spread and there are reports of only sporadic cases in new communities. There have been 1,009 confirmed cases as of 23rd March 2019, with 629 deaths - the case fatality ratio (the percentage of cases that die) is 60%. In the early outbreaks of EVD, in West Africa, the ratio was >90%.

The public health response continues to be hindered by further attacks by armed groups on affected communities and direct attacks on Ebola Treatment Centres (ETCs). These attacks not only cause fear and mistrust, thereby interrupting the effectiveness of interventions, but the unrest also increases population movement, and the risk of disease spread. However, over 90,000 people at risk have been vaccinated and there have been 42 million screenings at point of entry to reduce transmission across borders.

Thus, though the public health authorities are coping well with the challenges of containing the outbreak there continue to be spikes of case notifications despite the general declining incidence. Armed groups are now directly threatening the EVD response and the DRC continues to rely on outside agencies to strengthen their efforts to bring this outbreak to an end.

MOSQUITOES | The world's deadliest animal could hold the answer to pain-free injections



The World Health Organisation (WHO) estimates that there are in excess of 16 billion medical injections worldwide every year. Injections are painful. However, the mosquito, that is responsible for between 500,000 and 700,000 deaths every year, can insert a needle-like probe into your skin and draw blood for several minutes without you noticing.

Recent studies by researchers at the Ohio State University and Osaka University have been looking closely at how nature's design of 'needles' in mosquitoes could help us look at creating a microneedle that can be used for medical purposes. They identified the four key features of the female *aedes vexans* mosquito, the most commonly found mosquito in North America, that enable the insects to pierce our skin without pain:

- ↗ The use of a numbing agent - the insect releases saliva that contains a protein that anaesthetises the skin
- ↗ A serrated design to the 'needle', like a saw - this makes for easier insertion and less contact with nerves in the skin
- ↗ Vibration during the piercing - this helps lessen the force needed to pierce the skin
- ↗ A combination of soft and hard parts on the 'proboscis' (the part that feeds on us) - researchers found that the labrum was

softest near the tip and edges and became stiffer and harder farther in and up the labrum, thus deforming the skin less.

Incorporating these elements into a needle's design could revolutionise a medical instrument that hasn't changed for a very long time.

The prototypes are tending towards a microneedle made of silicon, and the diameter of a human hair, with two needles inside: the first to immediately inject a numbing agent and the second to draw the blood or inject the drug. This would be a more expensive alternative to current needles but the needles could be used on children and adults who are particularly phobic of needles.

Not only are mosquitoes finally proving themselves to be an inspiration in revolutionising the needle, but they are also helping researchers find alternative ways to monitor blood sugars, blood cholesterol and other parameters with permanently placed microneedles, that could wirelessly, and painlessly, transmit vital information to a remote monitor. One day the mosquito may be responsible for saving more lives than it harms.

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