The Global Measles Epidemic Isn’t (Just) About Measles

Strong health systems, along with immunization efforts, are key to fighting disease around the world.

M easles, once a common and deadly childhood illness which had been declared “eliminated” from many parts of the world including the United States, Canada and Europe nearly two decades ago, is back on the global health agenda. Measles cases globally rose nearly 300 percent in the first quarter of 2019 as compared with the first quarter of 2018, according to surveillance data covering 190 countries released last week from the World Health Organization.

Over 112,000 cases were reported to start this year, as opposed to just over 28,000 from the beginning of 2018. That year likewise saw a significant gain as compared to 2017. Although still not close to the shocking levels of the mid-20th century, when tens of millions of children were infected and millions died, the trend for new measles infections seems to be inexorably and frustratingly on the rise.
This trend places children under the age of 10, particularly in poor and conflict-affected parts of the world, at increasing levels of entirely avoidable risk.

**THE GLOBAL MEASLES RESURGENCE**

One of the most common explanations in the media for the measles resurgence has to do with a set of beliefs promoting reluctance to follow through with childhood vaccinations. The WHO earlier this year labeled this emerging reluctance one of the world’s “top ten” threats to global health.

The spread of misinformation about childhood vaccination is leading to a wave of what the World Health Organization calls “vaccine hesitancy.” Over time, declining tendencies to follow through on evidence-based public health recommendations may threaten long-established successful practices, which have improved the health of children since the mid-20th century.

In parts of California, New York and Washington State, for instance, there is evidence that relatively small outbreaks have been correlated with reduced vaccination rates due to anti-vaccine misinformation combined with novel introduction of the virus, often through travelers.
Globally, however, how can the disease’s resurgence be explained? Without question, the world needs to remain vigilant to any possibilities that the consensus around childhood vaccination may be undermined over time by rising “vaccine hesitancy.” However, large numbers of people around the world are still not able to access the vaccinations they both want and need.

MEASLES, CONFLICT AND HEALTH SYSTEMS

In addition to the effect of vaccine hesitancy, we need look no further than the WHO’s own country-level data on the locations and growth trends of measles cases. Almost all the enormous jump in measles cases from 2017 until the beginning of this year is attributable to a handful of places. This year, almost two-thirds of the entire reported global measles caseload is attributable to just two countries: Ukraine and Madagascar. These two countries are highly instructive as to the true reasons why we should pay attention to measles as something like a “canary in the coalmine” for the underlying weaknesses of public health systems.

Let’s start with Ukraine, which may appear, at first glance, to be the most puzzling.

Why should a middle-income country on the edge of Europe, with a historically reliable, near-universal public health system, suddenly become a kind of poster child for the rampant spread of infectious childhood illnesses for which immunization exists? The answer is pretty simple: conflict.

Prior to 2014, Ukraine maintained a measles vaccination rate of 95 percent, generally considered the gold standard level for herd immunity. Then, conflict broke out between Ukraine and Russia. As a result, the Ukrainian Ministry of Health budget was frozen and measles vaccination procurement largely ceased until late 2015. By 2016, Ukraine’s vaccination rate had plunged to just 41 percent, one of the lowest rates on the planet.

In subsequent years, the vaccination rate in Ukraine crept back up close to its pre-conflict levels, with about 91 percent coverage achieved last year. But the damage had been done. A multi-year cohort of Ukrainian children had lost their immunity to the disease. Combined with widespread disruption of the primary health care system, and the physical effects of conflict on large numbers of communities, measles took root again quickly and began to spread.
Some of the migration of measles from the Ukraine epidemic has apparently gone international, with cases in New York, Israel and elsewhere traced directly to index cases of travelers from Ukraine.

Elsewhere, in places from Yemen to Nigeria, one can also detect the sharply negative impact of conflict on basic health system capacities and measles infection rates. The lessons of the Ukrainian measles epidemic, as is also the case with these other countries, are not only that it doesn’t take much to fundamentally disrupt a well-functioning health system and produce an otherwise preventable outbreak. Disruptions to health systems in one country, given high levels of global mobility through air travel, can quickly be felt in many places throughout the world.

**THE PERIL OF UNDER-FUNDING HEALTH CARE**

The ongoing situation in Madagascar, which Direct Relief continues to respond to with local partners including the Ministry of Health, is quite different from that in Ukraine. Madagascar is one of the least developed countries, with a Human Development Index (HDI) that ranks 161st out of 189 measured countries. Its public health budget has been constantly under pressure for many years simply due to the tradeoffs required to manage multiple emerging health threats to rapidly changing communities. As a result, the measles vaccination rate in Madagascar has fallen to one of the world’s lowest at 58 percent.
Vaccination is not the only element of the health system that leads to increased likelihood of measles contagion. Poor nutrition leads to weakened immune systems for children and diminished capacity to resist infection. This is one of the key reasons why Direct Relief has been assisting with distributing of high-dose vitamin A to strengthen immune systems for vaccinated and unvaccinated children alike.

Weak primary care systems also present challenges to ensuring that all children are regularly seen by a physician and that suspect cases of measles are quickly identified and treated. Combined with low vaccination rates and persistent under-nutrition, weak primary care and disease surveillance can allow cases to multiply well before there is a chance to identify and intervene.

**THE KINDLING THAT SPARKS AN OUTBREAK**

Measles is well suited to epidemics given these system weaknesses. The reproduction rate for measles, the number epidemiologists use to measure the likelihood that one infected person infects others in the absence of countermeasures, is very high.

A systematic review in The Lancet from 2017 confirmed an average reproduction rate of 18, with considerable observed variance depending on contextual factors including poverty and the strength of health systems. That means a single measles
infection may commonly produce at least 18 new infections in the absence of counter-measures. Likewise, measles is infectious for 7 days prior to the individual becoming symptomatic, which means that infections can easily spread undetected. That astonishing rate of transmission, including challenges with early detection, is what constantly threatens to transform measles outbreaks into exponentially growing epidemics.

In addition to defending the core public health value and practice of mass vaccination, we still have a long way to go to achieve genuine universality of vaccine access, not to mention the related health systems interventions that maximize the chances of children to resist infectious diseases. That lack of equitable access threatens the most vulnerable in those countries most of all. But it threatens communities far outside their borders too given the fluency of global trade and travel.

Weak primary health systems, whether born of conflict, poverty or, as is often the case, a combination of both, remain among the greatest threats to human health everywhere.

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