

VIEWPOINT/COMMENTARY

Vaccination programmes in times of the SARS-CoV-2 pandemic

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Abstract

Vaccination programmes have been one of the most successful public health interventions over the last decades. Since the beginning of the SARS-CoV-2 pandemic, these programmes have experienced severe disruptions and temporarily even complete cessation in numerous countries. Factors contributing to this situation were logistic barriers like lacking vaccine supply or missing global and national transport opportunities, as well as policy decisions by governments and high-level global institutions to stop or delay vaccination activities in order to mitigate the spread of the pandemic.

In the affected countries, reasons for the service disruption may have been the perceived need to strengthen the health system response against the pandemic by shifting staff to this area, or the apprehension that vaccination activities may contribute to a rapid spread of the pandemic. Parents may have feared risk of infection for their children or themselves. Together, these factors led to the current situation that more than 80 million children missed some or all of their their routine vaccinations.

Early projections and data from the field support the view that continuing with vaccination sessions would not contribute to the spread of the pandemic to an extent that would outweigh the benefits of vaccination, and health workers could use this opportunity for spreading preventive messages about COVID-19 among the attending families.

Based on medical, epidemiological, structural and ethical arguments/deliberations, we argue that global health organizations and governments in all countries must overcome infrastructural barriers and policy issues as soon as possible in order to restore, catch-up and continue with their vaccination programmes. This will save the lives of millions of children now and in the future and will add to strengthening the national health systems and vaccinations programs in their fight against the SARS-CoV-2 pandemic.

Vaccinations, usually administered via the national Extended Programme on Immunization (EPI), are among the most successful preventive interventions in global health, especially in low-and-middle-income countries (LMICs) [1]. Still, out of 136 million infants some 14 million did not have any access to EPI services in 2019. A total of 6 million did not complete their routine three doses of diphtheria, tetanus, and pertussis (DTP3) immunization schedule [2,3]. Global coverage for DTP3 and the first dose of measles vaccines has stagnated around 85-86% for several years [2]. Vaccine-preventable deaths amounted to at least one million cases per year in children under five in 2019, among them more than 200,000 children who died from measles [1,4]. Recent events and decision-making in response to the SARS-CoV-2 pandemic affected already stretched vaccination programmes further and may have severe long-term consequences for child health globally, but also provide lessons for health workers and policymakers.

While WHO declared the spread of SARS-CoV-2 a pandemic on March 11th, 2020 [5], vaccination programmes (VPs) were increasingly facing disruptions or even complete cessation. Due to the shutdown of production facilities and international transport, vaccine supply was disrupted on a global level. Countries had to rely on rapidly diminishing stocks, especially in LMICs [6]. Within countries, distribution of vaccines to the local service providers was severely impeded as transport became almost impossible due to national lockdowns. VPs stopped their activities on a wider scale as they could not provide supplemental immunization activities (SIAs) and outreach campaigns anymore, or health services were closed completely [7].

Towards the end of March 2020, the Global Polio Eradication Initiative, the Measles & Rubella Initiative and WHO issued statements to stop SIAs/mass vaccination campaigns (MVCs) temporarily in places without an active polio or measles outbreak [8,9,10]. These guidances coincided with an on-going upsurge of polio outbreaks in Pakistan, Afghanistan and 15 other African and Asian countries and measles outbreaks in at least 14 countries [11,12].

The reason given in these documents was to mitigate the spread of the SARS-CoV-2 pandemic. It was probably feared at that time that 1. the COVID-19 pandemic would be so devastating in LMICs that deaths rates would soar quickly if not countered by a massive health system response, hence the perceived need for shifting health workers to these sectors; and 2. there would be a high risk for health workers to contract the infection during vaccination activities, the same applying to the children and their caretakers/families, thereby contributing to a rapid spread of the virus.

Being aware of the risks of interruption of VPs, WHO issued a cautious recommendation with regard to the national EPI programmes [8]. It stated that immunization is a core part of health services and that its continuation should be prioritised for the prevention of vaccine-preventable diseases (VPDs) during the pandemic whenever feasible. Countries should assess individually if the local epidemiology of the pandemic permits either the continuation, needs a focus on at-risk groups or necessitates a temporary suspension of their EPI programmes [8].

This recommendation was intended to support the continuation of vaccination activities, but at least 38 LMICs temporarily suspended their SIAs, and another 68 LMICs decided likewise with regard to their EPI programmes [10,13]. In affected countries, the reasons for the disruptions have been manifold. Many countries were facing the aforementioned major logistic barriers. Other reasons included disruption of health services, fears that vaccination services would spark the pandemic, staff would experience social isolation or rejection when participating in SARS-CoV-2-related activities, impaired mobility of health workers or their transfer to health system sectors fighting COVID-19 [6,7,14]. Among families, misinformation and rumours about service interruption, impaired access to vaccination sessions or parental fear about risk of infection during vaccination sessions may have been relevant [15,16].

At that time, it was projected that more than 80 million children could be at risk of missing their routine vaccines, in addition to about 94 million children who could miss their measles vaccination [10,13,17,18]. The devastating effect of measles on non-vaccinated populations has been demonstrated in the post-Ebola era in Guinea, and has been noted throughout the last decades [4, 19,20]. Observing this development, WHO, UNICEF, GAVI and partners issued several statements, warning against the risks and urging the global community and local governments to restore EPI activities and SIAs as soon as possible [3,7,10,13,17].

The initial decisions made by national governments and global health organizations were somehow owed to the near-global shutdown, but also based on preliminary assumptions. Even during the early phase of the pandemic, there was no indication that children were the main source of transmission [21,23,24,25]. It was unlikely that they would be a major source for fuelling the pandemic or be at increased risk of infection during SIAs and EPI administration in LMICs. In case of infection, the vast majority of them has only mild symptoms, although, admittedly, we do not know up to now what happens in children with severe malnutrition, tuberculosis, AIDS or malaria [22]. There may have been fears that health workers and caretakers would be at increased risk of infection during vaccination sessions as these typically consist of gatherings of large groups of people. As far as we know by now, contact with adult COVID-19 patients is the main source of infection, but health workers could continue with their EPI activities if provided personal protective equipment (PPE) [22]. Lack of PPE has been a common problem both in VPs and in caring for COVID-19 patients in the hospital setting in most LMICs; risk of infection would be most likely higher in the latter situation [26].

Early modelling data supported our and the view of others [18] that continuing with vaccination sessions would not contribute to the spread of the pandemic to an extent that would outweigh the benefits of vaccination [27]. The authors estimated that "*for every one excess COVID-19 death attributable to SARS-CoV-2 infections acquired during routine vaccination clinic visits, 84 (95% uncertainty interval 14-267) deaths in children could be prevented by sustaining routine childhood immunisation in Africa*" (excerpt from abstract) [27]. The study focussing on sub-Saharan Africa expected that vaccinated children, their siblings and parents, as well as elders in their households would benefit considerably, even when only considering child deaths prevented by measles vaccinations. In addition, health workers could use this opportunity for spreading preventive messages about COVID-19 among the attending families.

In 2019 WHO proclaimed vaccine hesitancy as one of the ten biggest threats to global health [28]. To combat vaccine hesitancy and low vaccination coverage, WHO, UNICEF, GAVI and others have been at the forefront of supporting EPI throughout history. But recommendations issued by influential leaders in this field do play a major role in the decision-making process, here by national governments and families [29]. During the initial phase of the pandemic with all its associated uncertainties, WHO and partners may have underestimated the effect of their guidance on SIAs/MVCs on other vaccination activities [8,9,10]. Despite the major impact of the lockdown measures on VPs, this may have unintentionally contributed to the reversal of impressive gains in vaccination coverage earned over decades in LMICs.

Temporary suspension of VPs may severely affect coverage rates for long periods of time [1,3,7,10,13,17]. This was demonstrated recently in a study from Pakistan which showed a 50 percent decline in vaccination rates during the lockdown period [30]; we hope for more studies to document these effects. Without successful catch-up programmes, complete annual birth cohorts would enter childhood without any protection against VPDs with devastating consequences. It may cost the life of millions of children when measles, whooping cough, polio or (neonatal) tetanus will rise massively in the unprotected population [18,30].

From an ethical perspective, one has to ask whether it is justifiable to accept the closing-down of VPs or the transfer of health workers assigned to SIAs and EPI activities to those health service sectors which fight the SARS-CoV-2 pandemic. Even when taking a utilitarian view, it would have been more beneficial to continue with VPs saving many more lives than treating COVID-19 patients, especially with only very limited resources and questionable outcome [18,27,31,32]. We are convinced children deserve our continuous care, support, and protection as they are highly vulnerable during their early years, depend on adult caregivers as they grow up, and constitute the future of any given society [33,34,35].

The long-term success of EPI rests on trust [1,28,29,36,37,38]. Abandoned or interrupted services, even if only short-lived, undermine this trust. Immunization rates drop rapidly [30,38], and VPDs like measles may rise sharply as observed during the post-Ebola era in West Africa in 2015 [19]. Catch-up activities will face many difficulties in achieving sufficient vaccination rates after disruption as seen in Sierra Leone post-Ebola [39], and delayed vaccination is a risk factor for increased morbidity and mortality in the child population [40,41]. It is much more difficult to restore vaccination services and to achieve previous coverage rates than to continue with them even under adverse circumstances [42,43]. Lastly, the disruption of SIAs and EPI risks the introduction of a vaccine against SARS-CoV-2, impedes its distribution as the health systems may become defective, and parents may be undecided about the introduction of a new vaccine [13].

Governments and global health organisations involved in immunization activities must continue to restore VPs as much as possible to save the lives of several million children. To succeed in these activities, WHO developed a guidance for planning and implementing catch-up vaccination campaigns [44]. At the Global Vaccine Summit last year, the global community made a bold financial commitment to support all countries and partners in their efforts to continue with EPI and catch-up vaccination campaigns [45]. Hence, there is no reason to limit proven, highly effective prevention programmes during the pandemic with uncertain outcomes and impact, especially, but not exclusively, in LMICs [22,32, 46,47,48,49]. Well-functioning VPs will contribute to strong national health systems which are needed in the continuous fight against the SARS-CoV-2 pandemic.

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CK performed the initial literature research, wrote the draft manuscript, revised, read and approved the final version.

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Paper context

Vaccination programmes have been one of the greatest achievements in global health. The SARS-CoV-2 pandemic caused severe disruptions of these programmes globally, often due to infrastructural barriers, governmental decisions and high-level policy guidance to postpone vaccination activities in order to mitigate the pandemic. Missing routine vaccinations and supplemental vaccination activities may risk the lives of more than 100 million children worldwide. All stakeholders must take rapid action to restore vaccination activities as soon as possible.

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