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Impact of COVID-19 on the child calendar vaccination in some countries

Doniyor KARIMOV¹, Rustam FAYZULLAEV², Shavkat AZIMOV³, Bakhtiyor BEGMATOV⁴, Bakhodir ERGASHEV⁵, Mokhinabonu AHMEDOVA⁶, Lyudmila ALADOVA⁷

Tashkent State Dental Institute Westminster International University in Tashkent Tashkent Medical Academy

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ABSTRACT

In this paper, it was analyzed how different nations of the world are addressing the emerging problems of vaccination decline during COVID-19 pandemic, their successes and losses, the differences in their vaccination strategies. In addition, it was examined what measures have been taken in various countries of the world to safely continue routine vaccination. The COVID-19 pandemic around the world has had different impacts on their routine child immunization programs. Not all countries in the world have seen a critical decline in immunization coverage rates. Despite the pandemic, several countries have conducted mass vaccination campaigns with the appropriate infection prevention measures after positive benefit-risk ratios were ensured.

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Баъзи мамлакатларда COVID-19нинг болалар календар вакцинациясига таъсири

АННОТАЦИЯ

¹ Assistant, Tashkent State Dental Institute. E-mail: doniyorkarimov.office@gmail.com.

² Student, Westminster International University in Tash kent. fayzek@gmail.com.

³ Assistant, Tashkent State Dental Institute. E-mail: mrashidova7@gmail.com.

⁴ Associate professor, Tashkent State Dental Institute. E-mail: bakhtiyorbegmatov.office@gmail.com.

⁵ Assistant, Tashkent Medical Academy. E-mail: dani_karimov@list.ru.

⁶ Student, Westminster International University in Tashkent. E-mail: mrashidova7@gmail.com.

⁷ Senior lecturer, Tashkent Medical Academy



Калит сўзлар: COVID-19, вакцина, эмлаш, болалар.

Ушбу мақолада дунёнинг турли мамлакатларида СОВИД-19 пандемияси даврида болаларнинг календарга мувофик емланишининг пасайиши билан боғлиқ юзага келган муаммоларни қандай ҳал қилинаётгани, муваффақиятлар ва йўқотишлар, емлаш стратегияларидаги фарклар тахлил қилинди. Бундан ташқари, дунёнинг турли мамлакатларида мунтазам емлашни хавфсиз давом еттириш учун қандай чоралар кўрилгани ўрганилди. Бутун дунё бўйлаб СОВИД-19 пандемияси болаларни мунтазам емлаш дастурларига турли хил таъсир кўрсатди. Дунё мамлакатларида емлаш билан қоплаш кўрсаткичларининг кескин пасайиши кузатилмаганлиги маълум бўлди. Пандемияга қарамай, бир қанча мамлакатларда фойда ва хавф нисбати ижобий таъминлангандан сўнг СОВИД-19 бўйича чеклов чоралари кўрилган холда календарга мувофик оммавий емлаш кампаниялари ўтказилганлиги аниқланди.

Влияние COVID-19 на календарную вакцинацию детей в некоторых странах

Ключевые слова: COVID-19, вакцина, иммунизация, дети

АННОТАЦИЯ

В этой статье было проанализировано как разные страны мира решают возникающие проблемы снижения вакцинации во время пандемии COVID-19, их успехи и неудачи, различия в их стратегиях вакцинации. Кроме того, были изучены принятые меры в различных странах мира для безопасного продолжения плановой вакцинации. Пандемия COVID-19 во всем мире по-разному повлияла на их регулярные программы иммунизации детей. Было выяснено, что не во всех странах мира произошло критическое снижение уровня охвата иммунизацией детей. Несмотря на пандемию, после того, как было обеспечено положительное соотношение пользы и риска, некоторые страны провели кампанию плановой вакцинации детей, соблюдая соответствующие меры предосторожности.

INTRODUCTION

Every child in the whole world is faced with an issue of vaccination from the very first days of birth. Vaccination of children is necessary because this method of prevention allows to protect the body from a number of dangerous infectious diseases and provides fewer complications. The younger the child, the more dangerous an infectious disease for him. According to World Health Organization, routine vaccination prevents around 2-3 million deaths per year (WHO, 2019).

Despite this fact, about 20 million children worldwide were not immunized in 2018 (WHO, 2019). But after the emergence of novel coronavirus SARS-CoV-2 in 2019 in Wuhan, the threat to childhood health increased significantly. Although the direct impact of the COVID-19 pandemic on children is small, it has a huge indirect impact on child mortality and the incidence of other infectious diseases. One of these crucial effects is the

impact of a pandemic on the child vaccination calendar. COVID-19 has detained or stopped the global vaccinations programs and is at risk of inducing a spread of other vaccine-preventable diseases (VPDs) like. This is because of difficulties such as travel restrictions or lockdowns, lack of information, fear of COVID-19 infection, overstressed healthcare systems, closure of schools, healthcare providers employed to pandemic duties, logistical obstacles, socio-physiological stress, and lack of protective gear. According to UNESCO data from April 15, 2020, 91% of the world's school-age children have stopped their education due to the pandemic. Whereas in many countries of the world significant part of immunization is done at schools and preschool educational institutions. Immunization programs in all age groups, especially routine child vaccines, have been interrupted, re-organized, delayed, or completely suspended (Nelson, 2020).

Different countries around the world including Uzbekistan have coped with the challenge of maintaining routine vaccination in different ways with different results. Some of them have managed to maintain the rate of immunization at the level of the period before the COVID-19 pandemic, and some have not.

OBJECTIVES

In this paper, we studied and compared how different nations of the world are addressing the emerging problems of vaccination decline during COVID-19 pandemic, their successes and losses, find differences in their vaccination strategies and analyze them. In addition, in this article, we examined what measures have been taken in various countries of the world to safely continue routine vaccination.

DESIGN AND METHODS

This is a narrative review of the literature available in medical databases and of the report obtained by interviewing the Head of the Expanded Immunization Program and Chief Specialist of the Agency for Sanitary and Epidemiological Welfare (ASEB) in Uzbekistan.

We searched for original peer-reviewed papers from PubMed (MEDLINE) concerning the impact of COVID-19 pandemic to routine vaccination calendar of Uzbekistan and other countries using keywords "COVID-19 and Routine Immunization", "Calendar Vaccination and Pandemic", "Immunization and Infectious diseases", and "Child vaccination". 62 sources (50 journal articles and generics, 10 web pages, 2 guidelines and reports) in English were found, reviewed and analyzed by 3 public health master's students. Unfortunately, no data about situation in Uzbekistan was available. Therefore, we relied on information received from interviewing the official of Sanitary-epidemiological peace and public health service in Uzbekistan.

RESULTS

Given the Covid-19 crisis, it is estimated that at least 13.5 million people have missed routine immunizations in 2020. According to WHO, in the period from January 2020 to April 2020, approximately 1.4 million fewer doses of DPT were administered globally compared to the same period in 2019.

Recent studies in Africa have shown that every death from COVID-19 prevented by delayed vaccination can result in 29-347 future deaths from infectious diseases such as measles, yellow fever, polio, meningitis, pneumonia and diarrhea that could be prevented by immunization (Abbas et al., 2020).

Based on bitter experience and on such data, WHO recommended not to halt or delay the child vaccination programs. Due to the interim guidance of WHO from 26 March

2020 the routine vaccination of the population should remain sustainable wherever services can be conducted under safe conditions (WHO, 2020). But despite WHO's recommendations to continue routine immunization of the population, especially children during the COVID-19 pandemic, unfortunately, vaccination coverage in the world has gone 25 years back in about 25 weeks (Singh, Singha Roy and Sundar Sahu, 2020). Now breakdown of routine vaccination programs is reported by 68 countries and at least 80 million children are at risk of widespread infectious diseases due to COVID-19. Many countries of the world postponed their immunization programs in the first five months of the coronavirus pandemic. Measles or measles-containing vaccines were postponed in 27; inactivated polio vaccine was postponed in 7; oral poliovirus vaccine was postponed in 39; meningococcal conjugated A vaccine was postponed in 2; yellow fever vaccine was postponed in 5; and tetanus-diphtheria vaccine was postponed in 7 countries (WHO, 2020)

During the spread of COVID-19, in South Korea child vaccination rate ion in children aged under 35 months did not decrease significantly, while among children aged 4–6 years decreased by 1.4–1.9%. The total incidence of VPDs decreased by 10–50% between 2019 and 2020, especially with varicella. Thus, the COVID-19 pandemic did not result in a decrease in vaccination coverage among Korean children, which prevented a surge in vaccine-preventable disease incidence (Yu et al., 2021).

In Singapore, after the arrival of COVID-19 in the country, there was an observed 25.6% to 73.6% decline in Measles-Mumps-Rubella (MMR) uptake rates, 0.4 – 10.3% decline for Diphtheria-Tetanus-Pertussis-inactivated Polio-Hemophilus influenza (5-in-1), and 8.0–67.8% decline for Pneumococcal conjugate vaccine (PCV) across all 3 sites from January to April (Zhong et al., 2020).

According to the data, the process of vaccination has decreased almost throughout Italy, although in different regions in different ways. The two peaks of the largest decline in coverage in Italy in 2020 occurred in the period before the government declared national isolation (due to public fear of the first reported cases of COVID-19) and during the peak of the epidemic. The least immunization coverage was observed in children aged 1 to 6 years (especially DTaP and anti-meningococcus B immunizations), as the priority was given to children at 1 year of age.

During the COVID-19 outbreak, percent changes of vaccine coverage in 2020 relative to 2019 in United Kingdom (UK) were fluctuated. In comparison to 2019, hexavalent vaccination (against tetanus, diphtheria, pertussis, polio, hepatitis B and Haemophilus influenzae type b) was 5.8% lower (95 percent confidence interval (CI): -6.0 to -5.5) and measles-mumps-rubella vaccination (MMR) was 1.0 percent lower (95 percent CI: 1.1 to 0.9) at the beginning of 2020 (weeks 1–9). Weeks 10 to 12 is a time of transformation together with public survey of physical separation beginning at least in week 10. On March 12 (week 11) the United Kingdom authority recommended anybody with a recent continuous cough or high body temperature to self-isolate for a period of seven days. Physical distancing policies were implemented nationwide on March 20 (the end of the 12th week) and then continued on March 23 (the beginning of week 13), forcing anyone in the UK to stop crowds and unnecessary use of public transportation, restrict communication with others and work remotely if necessary. Hexavalent vaccination rates (weeks 10-12) were decreased by 4.4 percent (95 percent confidence

interval: -4.8 to -4.0) and MMR vaccination rates by 7.2 percent (95 percent confidence interval: -7.7 to -6.7) in 2020 than the previous year. Hexavalent vaccine coverage was reduced by 6.7 % (95 percent CI: -7.1 to -6.2) and MMR vaccination by 19.8 percent (95 percent CI: -20.7 to -18.9) within the three weeks after complete physical distancing steps were implemented (weeks 13 to 15). Vaccination coverage was higher in weeks 16 and 17 of 2020 than in weeks 16 and 17 of 2019, despite physical distancing procedure remaining constant to the study end of the period (McDonald et al., 2020).

A study in Sindh, Pakistan, indicates that child immunization coverage dropped by 52.5% during the first 6 months of the pandemic (Chandir et al., 2020). Polio catch-up immunization campaigns in Pakistan were postponed until June 1st, 2020 (Nelson, 2020).

In Indonesia about 84% of immunization services have been blocked by the pandemic; 20% of these were related to measles and rubella vaccinations (Dinleyici et al., 2021). In the pre-pandemic period, Indonesia's baseline childhood immunization coverage rate was 57.9%. According to the results of the study from local epidemiologists, due to the pandemic, this figure may fall to 43.0% (Suwantika, Boersma, and Postma, 2020).

A study conducted at the largest medical institution in Saudi Arabia showed that in March-May 2020, the admission of children aged 0-12 months at the clinic for routine vaccination fell by 2.5 times (50%, 72% and 69% of reduction in March, April and May respectively) compared to the same period of the previous year. (Alrabiaah et al., 2020). All vaccination visits during April and May 2020 were below the lower extremes except for the birth vaccinations. Another cross-sectional study conducted in Qassim province in Saudi Arabia shows that between May and June 2020, about a quarter of surveyed parents indicated a more than a month delay of vaccinations for their children.

The least successful results in continuing vaccination were observed in some African countries. Among African countries, Angola, Central African Republic, Chad, the Democratic Republic of the Congo, Gabon, Guinea, Nigeria, and South Sudan deserve special attention, since the greatest decrease in coverage rates by vaccination was observed in these states. It should be noted that in these countries, immunization coverage of the child population was low even before the pandemic. For example, Diphtheria-Pertussis-Tetanus containing vaccine (DPT) and measles-containing vaccine (MCV) coverage in 2019 in Chad was approximately 50% and 41%, in the Central African Republic 47% and 49%, in Guinea 47% and 47%, respectively. Since the onset of the pandemic, the countries with the lowest rates before the pandemic have seen the greatest declines in immunization rates with these vaccines. For example, in Gabon and Guinea, DPT coverage in the second quarter of 2020 decreased by -28% and -52%, respectively. It should be noted that at the time of June 2020, in these same countries there was the highest prevalence of COVID-19 (Masresha, Luce, Shibeshi, et al., 2020) (Urlaub and Perez, no date).

In Latin America and the Caribbean, the situation is expected to be even worse as routine immunization coverage has declined significantly over the past 20 years.

The population immunization strategy in Peru is one of the most effective in Latin America, but despite this in October 2020, in the middle of the pandemic, Lima announced the first case of diphtheria in 20 years from which there was a decrease in immunization coverage due to lockdown (Mezones-Holguin et al., 2021). Another diphtheria case was reported in Venezuela during the pandemic (coronavirus-vaccinesmeasles @ www.nytimes.com, 2020).

In Uzbekistan after the detection of coronavirus infection in Uzbekistan on March 15, 2020 the Ministry of Health together with the Sanitary-epidemiological peace and public health service prepared an indicative letter and road map on immunization and the observance of all sanitary and hygienic standards at vaccination points in accordance with the recommendations of the World Health Organization and the United Nations Children's Fund (UNICEF) to continue routine immunization in all countries of the world. Immunization against 13 types of infectious diseases is carried out in Uzbekistan.

Оп average, about 2.5 million children are vaccinated every month. But since March 16, about 2.4 million children have received vaccines. 8-10% of the unvaccinated are children who have been given a medical challenge, and those who could not come for various reasons (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date)(Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date) (Почему важно продолжить плановую иммунизацию в период пандемии – Газета.uz, no date).

DISCUSSION

According to the data one of the most successful countries that managed to sustain continuous vaccination of children in South Korea. This results had been achieved by the help of timely solid vaccination program. The Korean National Immunization Program is characterized by full free support for national vaccinations of children under 12 years of age and the management of the vaccination ability of the individual using an integrated vaccination management system (Go. Kr, 2020) (2020, 2020).

By the help of physical distancing activities in 2020 decreased not only vaccination process and coverage, but also the incidence of vaccine-preventable diseases. The VPD incidence in the first half of 2020 decreased from 2019.

Health decision-makers must continuously aware the community about the importance of vaccination and lead them to vaccinations on time. The authorities have implemented a policy to boost vaccination at private clinics (Yu et al., 2021).

There was no notable VPDs outbreak in Singapore in the last 15 years. Routine vaccination of children in Singapore is carried out in three types of medical institutions: public primary care clinics, hospital pediatric units, and private pediatrician clinics (Ахмеджанова et al., no date). Singapore instituted public health measures targeted at COVID-19 subsequent to the first reported case on 23 January 2020. These were increasingly restrictive through January to March 2020, culminating in border closures on 23 March and a near-lockdown mandating cessation of nonessential services and school closure on 7 April. Routine childhood vaccinations from 0 to 18 months of age were considered essential and remained available during this period. Despite this, the decline was most noticeable in private clinics and least in the hospital. Authors state that the most likely reason for the apparent decline in child immunization rates is most likely

associated with parental hesitancy and fear of contracting the virus (Chang et al., 2004). The main reason for the decline in rates in private clinics is probably the closure of borders. Considering the fact that Singapore is a recognized center of medical tourism for its neighboring countries, the admission of foreign citizens to private clinics dropped sharply during the isolation of the state.

MMR vaccine rates began to decline in 2020 in UK prior to the implementation of physical distancing steps because of the COVID-19 outbreak. MMR vaccine coverage was declined by 19.8 percent (95 percent CI: -20.7 to -18.9) in the first three weeks of social distancing than in the same timeframe in 2019. There was a general reduction in the number of hexavalent vaccines administered in 2020 compared with the previous year, but there was no indication of a faster rate of decline because of the implementation of physical distancing. In spite of physical distancing being in place MMR and hexavalent vaccination coverage expanded in 16th and 17th weeks of the observation.

Results of the study (McDonald et al., 2020) showing lower vaccination coverage are in line with the data of the studies conducted in other high-income countries. In the United States, regular children vaccine counts fell since the state of emergency was proclaimed on March 13, however improved slightly for measles vaccines given to children under two years, which the scientists believe may be due to promotion of child vaccination in the background of the pandemic.

Countries with weaker health systems are particularly vulnerable to health service disruptions caused by outbreaks, natural disasters, protracted armed conflict, or civil disturbances (Grundy and Biggs, 2019).

The main reasons for the decline in vaccination rates in Pakistan were that in most provinces a large portion of the population (45.5%) lived in slums. Other factors that worsened the situation were traffic restrictions, lack of public transport, medical staff worries about exposure to the virus (lack of personal protective equipment), lack of reliable communication between vacancies and officials, and parents' fear of becoming infected (Chandir et al., 2020).

The highest death toll due to COVID-19 in South-East Asia was observed in Indonesia in 2020 (Urunova and Akhmedzhanova, 2021). And this was reflected in the organization of preventive mechanisms of local health care, especially in the routine immunization of the child population.

In Indonesia, all immunization programs are government-funded. School-age children receive all routine vaccines in their schools. Under this program, measles, diphtheria, and tetanus vaccines are given in the first grade of primary school, while tetanus and diphtheria vaccines are given in grades 2 and 5 of similar schools. In the period before the pandemic, about 15 million children a year were immunized in the state (Muhadir, 2009). As Indonesia is a country made up of many islands socio-economically developed to varying degrees, with the onset of the pandemic, this difference has become even greater. Moreover, all schools in the country were closed by order of the government on March 16, 2020.

In Saudi Arabia, vaccination is provided free of charge for all families under the government's primary healthcare system. However, insured families also have access to care from the private sector as well as the government's primary healthcare system. Most of the parents from Saudi Arabia (61%) indicated the fear of contracting coronavirus as the reason. Another important reason (9%) was the inability to find an appropriate functioning medical facility (Alsuhaibani and Alaqeel, 2020). In one study conducted in

Saudi Arabia, about 72% of parents surveyed preferred to be vaccinated at home (37%) or in specially organized vaccination facilities (35%) (Alsuhaibani and Alaqeel, 2020).

Child immunization has been poor in many African countries, despite the bitter experience with Ebola in 2014. Kaja Abbas et all used a mathematic model in 54 African countries to find out what is better: to fewer COVID-19 associated diseases or be sure that all children get their routine vaccinations on time. They concluded that on time immunization has much greater benefits than the risks of extra deaths due to coronavirus and recommended to continue routine immunization among children under 5 years age. In the worst scenario, giving vaccinations, as usual, will prevent around 700,000 deaths in children. Measles and pertussis would have caused most of these deaths. And for every extra death due to COVID-19, vaccination will have prevented 84 deaths in children under five (the benefit-risk ratio is 84). In the 'better' scenario, the benefit-risk ratio of a sustained vaccination program is 3 (Abbas et al., 2020). Due to the halted vaccination programs in Africa, there were many outbreaks of VPDs in 2020. New measles, polio and cholera outbreaks emerged in Nigeria, Chad, Ethiopia, Ghana, Cameroon, Mozambique and South Sudan. In the face of the COVID-19 pandemic, Ethiopia conducted a national measles campaign in July 2020, while DR Congo conducted measles outbreak response and mop-up vaccination in the months of March – June 2020. Both countries undertook these exercises, taking into account the local COVID-19 transmission, and implementing specific COVID-19 prevention measures. There is no evidence to date that these mass vaccination activities contributed to further spread of COVID-19 in the respective countries (Regional Strategic Plan for Immunization, 2020).

Previously, in Uzbekistan vaccination was carried out once or twice a week, but due to the pandemic, it is carried out daily. Under the old schedule, before the spread of COVID-19, 10–20 people had to wait in the corridors for their turn to vaccination. In order to avoid the spread of coronavirus infection have been taken measures to eliminate the congestion of people, so vaccination is carried out daily. In addition, the parents are informed in advance about the date and time of receiving the vaccine. Thus, contact with people when visiting medical facilities is minimized. Immunization offices are organized not only in family and rural polyclinics, but also in medical centers of "makhalla" gatherings of citizens, schools, and kindergartens. This work is done for the convenience of the population.

CONCLUSION

According to data the COVID-19 pandemic around the world has had different impacts on their routine child immunization programs. However, not all countries in the world have seen a critical decline in immunization coverage rates. Despite the pandemic, several countries have conducted mass vaccination campaigns with the appropriate infection prevention measures after positive benefit-risk ratios were ensured.

Countries that are behind the planned vaccinations should catch up as soon as possible since the consequences of missing routine vaccinations can bring the most disastrous results. In countries in which it is difficult to increase the level of coverage of the child population with immunization, it is necessary to effectively monitor the population for the occurrence of outbreaks of vaccine-preventable diseases and to be ready for timely measures to stop their spread. Strengthening the recovery process requires well-designed communication strategies and approaches to educate stakeholders and the general public about the potential impact of the COVID-19 pandemic and specific mitigation strategies for the continuity and effectiveness of the vaccination program.

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