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**VACCINE PROCUREMENT AND SUPPLY
FOR THE EXPANDED PROGRAM OF
IMMUNIZATION IN KAZAKHSTAN:
GAPS AND CHALLENGES
FOR ACTION**

Final Report

October 2021

VACCINE PROCUREMENT AND SUPPLY FOR THE EXPANDED PROGRAM OF IMMUNIZATION IN KAZAKHSTAN: GAPS AND CHALLENGES FOR ACTION

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TABLE OF CONTENT

ACRONYMS.....	5
ACKNOWLEDGEMENTS.....	6
1.INTRODUCTION.....	7
1.1. THE COUNTRY CONTEXT.....	7
1.2. THE PURPOSE, OBJECTIVES, AND THE SCOPE OF THE REPORT.....	8
2. ORGANIZATIONAL ARRANGEMENTS AND RESPONSIBILITIES FOR EPI IN KAZAKHSTAN.....	9
3. STUDY FINDINGS.....	11
3.1. DETERMINING SIZE OF THE TARGET POPULATION FOR EPI.....	11
3.2. QUANTIFICATION OF VACCINE REQUIREMENTS.....	14
3.3. BUDGETING FOR VACCINE PROCUREMENT.....	15
3.4. VACCINE PROCUREMENT AND DISTRIBUTION.....	17
3.5. MONITORING VACCINE USE AND POPULATION COVERAGE TARGETS.....	19
4.CONCLUSIONS.....	21
5.RECOMMENDATIONS.....	24
6. ANNEX 1 THE LIST OF REVIEWED DOCUMENTS.....	26

ACRONYMS

AFEI	Adverse Effects Following Immunization
BCG	Bacillus Calmette–Guérin vaccine
CSEC	Committee for Sanitary-Epidemiological Control
CT	Consultant Team
EPI	Expanded Program of Immunization
GSK	GlaxoSmithKline Pharmaceutical Company
IDI	In-Depth Interview
IIS	Immunization Information System
MCV	Measles containing vaccine
MICS	Multi-indicator Cluster Survey
NCEMMD	National Center for Expertise of Medicines and Medical Devices
NITAG	National Immunization Technical Advisory Group
RAP	Register of Attached Population (ПНП)
SGMS	State Guaranteed Medical Services
SOP	Standard Operating Procedure
TRT	Supply and Awareness Technical Reference Team
UNICEF	United Nations Children’s Fund
UNICEF CO	UNICEF Country Office in Kazakhstan
USAID	United States Agency for International Development
VPD	Vaccine-Preventable Diseases
WHO	World Health Organization

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1. INTRODUCTION

1.1. The country context

1. Kazakhstan, as of August 2021, has an estimated population of 19.02 million¹ and 57 percent live in urban areas leaving a sizable part of the population spread across the vast land. The country is a unitary state subdivided into 17 administrative divisions (oblasts and cities). Kazakhstan has made significant economic progress over recent decades. Health has risen on the policy agenda with several sector reforms introduced to modernize the system and improve the population's health². Kazakhstan's healthcare sector accounted for roughly 3.9% of overall GDP in 2019³. Government priorities in this sector include developing the country's primary healthcare network, improving its public health administration system, providing expanded medical personnel training, enhancing mother and child health services, and emphasizing preventive measures. In 2019, the Government approved the State Program for the Development of Healthcare 2020-2025 which prioritizes management and control of vaccine-preventable diseases among other public health priorities and designates the funds for centralized vaccine procurement and delivery.

2. During the last decade, the Government of Kazakhstan consistently reported high immunization coverage 98-99% for MCV1 and MCV2 vaccines. Despite high reported administrative coverage for measles vaccine, Kazakhstan faced a measles outbreak in 2015 with 2,340 cases and in 2019 when the magnitude of the epidemic reached 13,326 cases during the year⁴. Furthermore, a thorough analysis of

5,519 cases reported between April 1, 2018, and March 31, 2019, revealed that measles morbidity placed a toll on six regions of the country: in the city of Nur-Sultan – 42.6% (n = 2,350), in the city of Shymkent – 12.8% (n = 708), in Turkestan – 8.3% (n = 456), Mangistau – 4.8% (n = 266), Akmola – 3.8% (n = 211) and in Atyrau region – 3.7% (n = 205). One thousand eight hundred thirty-six cases, or the third, were found among children aged 0-12 months, indicating inadequate vaccine coverage among infants. The vaccination history of patients suggests that 92.3% were not vaccinated against measles⁵ pointing towards the gap in immunization coverage with MCV1 either due to vaccine supply disruptions or due to vaccine hesitance frequently reported in the media⁶.

3. The noted immunity gaps in the population could be attributed to the weaknesses in vaccine procurement and supply systems, problems in service delivery (high rate of contraindications), or problems related to the uptake of vaccination services by the target population groups (vaccine hesitancy among the population). According to the 2018 budget expenditure report, five out of seventeen Oblasts and/or cities failed to achieve their annual immunization targets due to delayed supply of vaccines which left about 63,000 individuals unvaccinated, according to the vaccination schedule⁷, which points to existing challenges related to the vaccine supply chain. COVID-19 related disruptions of immunization services are expected to worsen the situation further unless timely addressed. Therefore, to mitigate the measles outbreak and prevent the further accumulation of susceptible, un-immunized children,

¹ <https://worldpopulationreview.com/> accessed on February 08, 21

² *OECD Reviews of Health Systems: Kazakhstan 2018*

³ <https://www.trade.gov/country-commercial-guides/kazakhstan-healthcare>

⁴ *WHO Immunization Analysis and Insights* <https://www.who.int/teams/immunization-vaccines-and-biologicals/immunization-analysis-and-insights/surveillance/monitoring/provisional-monthly-measles-and-rubella-data> Accessed on May 5, 2021.

⁵ Zhuzhasarova A., Bayesheva D., Turdalina B., Aimahanbetovna A. *Epidemiological situation of measles in the Republic of Kazakhstan. International Journal of Infectious Diseases Volume 101, SUPPLEMENT 1, 366-367, December 1, 2020. DOI:https://doi.org/10.1016/j.ijid.2020.09.962*

⁶ Проблемы вакцинации в Казахстане обсудили эксперты. Медицина. 24.02.2020 <https://almaty.tv/news/meditsina/1710-problemy-vaktsinatsii-v-kazahstane-obsudili-eksperty> Accessed on May 5, 2021.

⁷ 2018 Budget Execution Report <https://data.egov.kz/> Accessed May 6, 2021

UNICEF decided to support the Government with technical assistance on multiple fronts, out of which this assignment is designed to address the possible gaps in vaccine quantification, forecasting, supply planning and budgeting for vaccine procurement.

Consequently, this report intends to contribute to the Government of Kazakhstan's efforts to respond to the measles outbreak, especially in procurement and distribution of vaccines, by following the National Plan of Immunization.

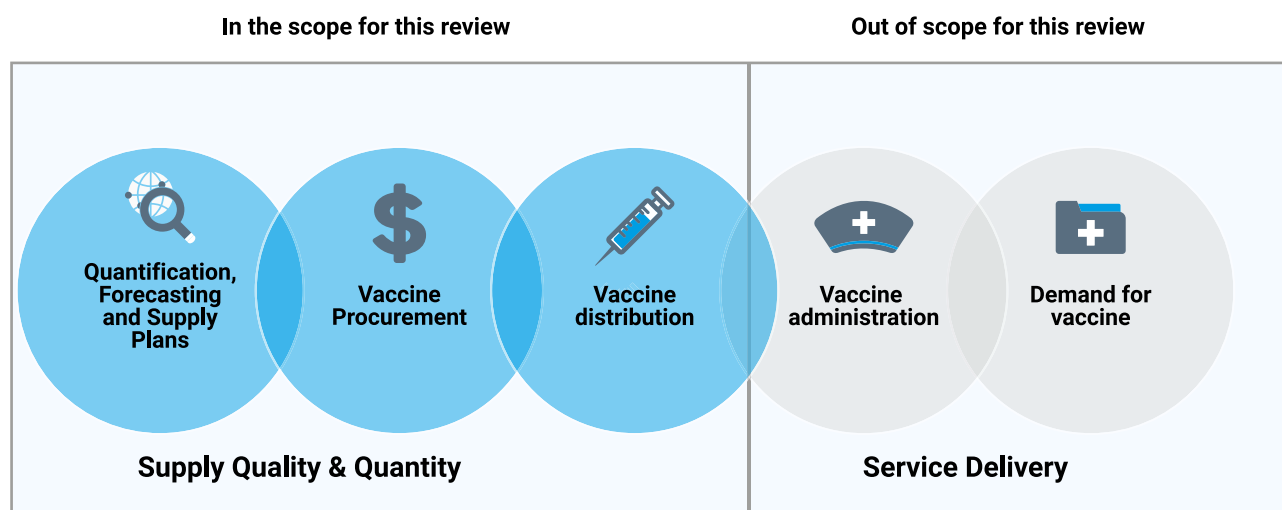
1.2. The Purpose, Objectives, and the Scope of the Report

4. Thus, the overall purpose of this report is to reveal elements of the vaccine procurement and distribution process in Kazakhstan, spotlight critical bottlenecks that negatively affect vaccine planning, procurement, supply, and distribution in the country. The report is intended to support national stakeholders in improving immunization service provision and avert potential outbreaks of vaccine-preventable diseases (VPD).

5. **The report only covers vaccines for routine immunization for children** as per the national vaccination schedule. Other vaccines used in the

country are out of the scope of this review. While the underlying causes for the measles outbreak, noted earlier, could be due to vaccine supply or demand-related issues, **the scope of the report is limited to vaccine quantification, forecasting, supply planning, procurement, and distribution issues only** (see Figure 1). As for matters related to vaccine administration on a facility level or demand for vaccines among the population (both are critical factors for achieving target vaccination coverage rates) are out of the scope. Most likely, UNICEF will investigate those through other means.

Figure 1 The thematic scope of the assignment



6. The consultants used a mixed-method approach combining desk review and secondary quantitative data analysis with in-depth interviews with key information on a central, oblast, and facility level. In total, 45 documents (not including planning and budget excel files) and 27 respondents

representing central/national level, two cities of republican importance, and six regions informed the study findings. Detailed methodology for this work is described in a separate document - Inception Report, available through the UNICEF CO.

2. ORGANIZATIONAL ARRANGEMENTS AND RESPONSIBILITIES FOR EPI IN KAZAKHSTAN

7. Several players are involved in the immunization program planning and management in Kazakhstan. Namely:

8. **The National Advisory Committee on Immunization**, established in 2012, plays an advisory role to the Government, develops recommendations around vaccination and new vaccine introduction in the national immunization schedule. Based on the recommendations most recent update of the

immunization schedule occurred with Government Resolution # 612, issued on September 24, 2020⁸ which defined the list of compulsory preventive vaccinations (See Table 1). The national immunization schedule establishes the rules, the timing, and the population groups targeted by these vaccinations. The vaccinations for children are financed through Republican budget transfers to Oblasts and are delivered at no cost to the population.

Table 1: Kazakhstan National Immunization Schedule⁹

Vaccine	Schedule	Entire country	Comment
Anthrax		No	Specific risk groups
BCG	Birth, 6 years	Yes	
DTaPHibIPV	3, 18 months	Yes	
DTwPHibHepBIPV	2, 4 months;	Yes	
HepA_Pediatric	2, 2.5 years;	Yes	
HepB_Adult		Yes	Unvaccinated healthcare workers
HepB_Pediatric	Birth;	Yes	
Influenza_Adult	> =15 years	Yes	And adults with chronic conditions, older persons, pregnant women in 2nd-3rd trimester, healthcare workers, residents of long-term care facilities
Influenza_Pediatric	6 months-14 years;	Yes	And children with chronic conditions
MMP	1, 6 year;	Yes	
OPV	1 year;	Yes	
Plague		No	In the natural focus of the plague
Pneumo_conj	2, 4, 12 months;	Yes	
Rabies		Yes	According to clinical indications
TBE		No	Residents of endemic areas
Td	16, 26, 36, 46, 56 years;	Yes	
Tdap	6 years;	Yes	
Tularemia		No	In the natural foci of tularemia
Typhoid_ps		Yes	Risk groups by occupation

⁸ <https://pharm.reviews/dokumenty/item/5527-postanovlenie-pravitelstva-rk-ot-24-sentyabrya-2020-goda-612>

⁹ Source: [https://apps.who.int/immunization_monitoring/globalsummary/countries?countrycriteria\[country\]\]=KAZ](https://apps.who.int/immunization_monitoring/globalsummary/countries?countrycriteria[country]]=KAZ)

9. **Oblast health departments** are responsible for estimating annual vaccine requirements for the oblast, developing immunization plans, and establishing vaccination coverage targets. They develop monthly vaccine distribution plans and allocate necessary funds for immunization from specially designated central budget transfers. They sign agreements with SK Pharmacia (a single distributor) for vaccine procurement and supply to the oblast and pay for their services from Oblast budgets.

10. **The Committee for Sanitary-Epidemiological Control (CSEC)** is a vertically organized system responsible for national surveillance of vaccine-preventable diseases (VPDs), surveillance of vaccination coverage, and adverse effects following immunization (AEFI). They monitor the timely and adequate execution of immunization plans developed by the Oblast health department using Excel™-based Form No.4. They also monitor vaccine usage and wastage rates monthly. Where necessary, they carry analysis and provide supportive and directive recommendations to the respective institutions, departments, or medical establishments.

11. **SK Pharmacia**, established in 2009, is responsible for procuring vaccines and injection equipment and distributing them countrywide, following the vaccine requirements and immunization plans developed by Oblast Health Departments. Thus, "SK Pharmacia" is the only responsible entity for organizing all state purchases of pharmaceutical products for state-funded guaranteed benefit package, including vaccines. The procurement of vaccines is conducted through tenders opened for domestic and foreign companies or through direct negotiations. Although in 2014, GSK signed an agreement with the MoH for local production of vaccines and oncology drugs, and later similar contracts were signed by Sanofi

and Pfizer¹⁰ Currently, "SK Pharmacia" procures only WHO prequalified vaccines¹¹ included in EPI that is purchased from foreign manufacturers and imported into the country.

12. Besides procurement, as noted earlier, "SK Pharmacia" also serves as a single distributor of vaccines and pharmaceutical products in the country. Procured vaccines are stored in central warehouses and distributed to Oblasts for storage and further distribution to districts/rayons and facilities. Thus, with regards to distribution, "SK Pharmacia's" role stops at the oblast level.

13. **Health Care Providers** - vaccinations are delivered throughout the network of primary care providers and other medical establishments spread across the country. Oblast health departments bear responsibility for their supply of needed vaccines and injection equipment. Healthcare providers are responsible for planning vaccinations for their catchment population following regulations spelled out in the MoH Decree 361¹², delivering injections and reporting to oblast health authorities as well as to the Committee for Sanitary-Epidemiological Control.

14. **Ministry of Health** bears overall responsibility for overseeing the immunization program's planning, procurement, distribution, delivery, and funding. For funding, the Republican budget for the Ministry of Health allocates designated budget resources for vaccine procurement and distribution under "Budget Program for Public Health 070," which includes central transfers to Oblasts "Budget Sub-Program 101" used for vaccine procurement by oblasts. A separate line item of the budget allocates resources necessary to cover the costs of actual vaccine administration on a healthcare facility level. On average, Kazakhstan allocates about 27 billion Tenge (about 63.5 million \$US) annually for vaccine procurement¹³.

¹⁰ BMI, *Kazakhstan pharmaceuticals and healthcare report, 2014*.

¹¹ Altyn Aringazina, Gabriel Guys, John P. Allegrante, *Public Health Challenges and Priorities for Kazakhstan; Central Asian Journal of Global Health, Vol 1, No 1 (2012)*.

¹² Order of the acting Minister of Health of the Republic of Kazakhstan dated June 13, 2018 No. 361 On approval of the Sanitary Rules "Sanitary and Epidemiological Requirements for Prophylactic Vaccinations to the Population."

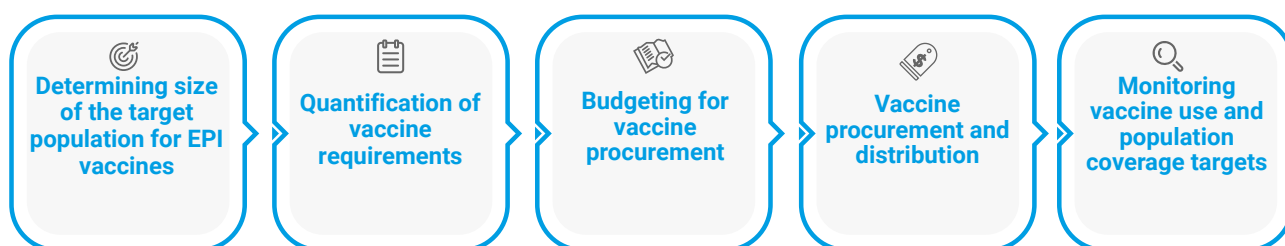
¹³ 27 billion Tenge is allocated annually for vaccines in Kazakhstan. https://tengrinews.kz/kazakhstan_news/27-milliardov-tenge-egodno-vyidelyayut-vaktsinyi-366053/ Accessed May 1, 2021

3. STUDY FINDINGS

15. This section of the report reveals study findings arising from (a) desk review, (b) secondary quantitative data analysis (comprising data from annual vaccination plans, budgets for vaccines broken by regions, annual budget execution reports, and data from Forms N3 and N4, used by the vaccination program) and (c) in-depth interviews. We first evaluate

the annual target setting for the EPI program, an essential step for appropriate vaccine quantification and forecasting. Then we move on to assessing vaccine quantification and budgeting practices and rules. Finally, we focus on vaccine procurement and distribution practices and the monitoring of vaccine use and population coverage (see Figure 2).

Figure 2 Steps taken to evaluate vaccine planning, procurement, and supply for EPI in Kazakhstan

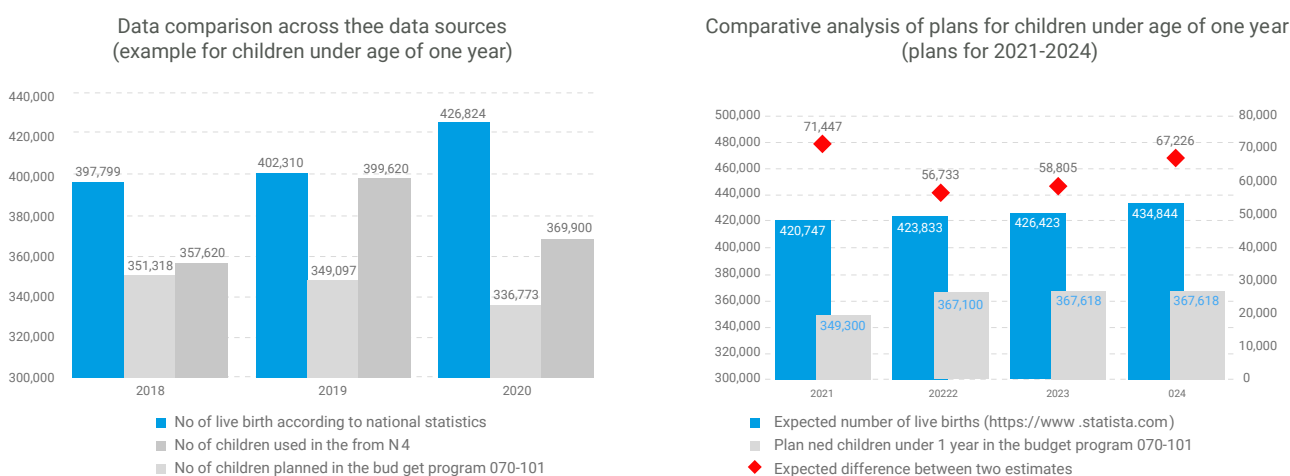


3.1 Determining Size of the Target Population for EPI

16. According to MoH Decree 361¹⁴ for the EPI program, the primary source for annual target planning is the facility-level population census (conducted twice a year) in the facility's catchment area. Therefore, all facilities compile the data in the planning form (standard form is being used throughout the country) and submit it to the district and then to oblast health departments for further compilation. Although respondents stated that superior authorities adjusted these

plans using data from the past three years of vaccine consumption (or birth at times), the rules or methods for adjustments were not standard. Consequently, much depends on an individual's knowledge or approach taken during adjustment by a responsible person, who in most instances acquired this knowledge and practice from colleagues and not from rules spelled out in the Standard Operating Procedures (SOP); usually referred to as «Metodichka.»¹⁵.

Figure 3 Evaluating Quality for EPI Target Setting



¹⁴ Order of the acting Of the Minister of Health of the Republic of Kazakhstan dated June 13, 2018, No. 361 On approval of the Sanitary Rules "Sanitary and Epidemiological Requirements for Prophylactic Vaccinations to the Population."

¹⁵ The Soviet Union used "methodological notes," which were prepared to standardize the practice across the country. However, this function has disappeared over recent years, and there is no entity legally charged with the authority to produce/update such methodological guidance. Neither old documents are in place to help those involved in vaccine planning.

17. Besides the lack of standard practices for target adjustments, the quality of data used for target setting on a facility, district, or oblast level also raises significant concerns. There seem to be several systemic shortcomings: firstly, the State Guaranteed Medical Services (SGMS) includes the benefits for newborns and children. But citizens to receive state-funded service need to be included in the Register of Attached Population (RAP). RAP operates on a PHC level and monitors the size of the population registered with the given medical establishments. RAP is used by all public, and those private sector providers contracted for SGMS service provision by the public purchaser. While RAP is expected to be the most complete register for children, a simple comparison of RAP numbers for children under one year of age with the national statistical office¹⁶ data reveals that RAP for 2020 underestimates children by 60-63,000. Secondly, the electronic information system does not link maternities with the PHC level, consequently discharged newborns from maternities are not being transferred to a PHC. Therefore the latter is not always aware if a newborn has arrived in the catchment area until the mother visits a facility. This deficiency becomes vivid when the number of children vaccinated with BCG 1st doze at the maternities in each oblast is compared with the number of infants vaccinated (or planned to be vaccinated) on a primary healthcare (PHC) level. A review of Form N4 vividly reveals such discrepancies.

18. To evaluate the impact of not-standardized practice for EPI target setting when using poor quality data, we compared the data from three different sources: the national statistical office about live births, the target numbers from the Form N4 (prepared based on facility reports), and target numbers for the Budget Sub-Program 070-101. For simplicity purposes, we only present data for under one-year-old children, the largest recipient group of EPI vaccines; however, the comparisons for other age groups included in EPI revealed similar shortcomings.

19. The comparison results for past years 2018-2020 are presented in Figure 3 (left), and how this practice affects the future planning period for 2021-2024 is

provided in Figure 3 (right). Both charts validate the qualitative findings from desk-review and in-depth interviews and clearly show that weaknesses of target setting are many-fold and include:

- The population targets for EPI set out in Form N4 (See Figure 3 (left)) are not consistent with the number of live births registered in the country, which **could result from poor data quality** used by facilities for planning. Consequently, planning targets for EPI underestimate the birth cohort by almost 12-21% (depending on the year of planning).
- Variable size of the target population from year to year (Figure 3 (left)), **not aligned with the demographic trend** of the nation, could be the result of (a) **lack of standardized practice** across individuals arising due to lack of SOPs in the country and (b) **lack of formal training arrangements and continuous professional development** for people involved in the EPI planning process.
- Finally, Figure 3 (right) reveals that the practice of EPI target planning is not adequately considering **expected demographic developments within the nation** over coming years and leads to 13.5 – 17.0% underestimation of the targets for 2021-2024.

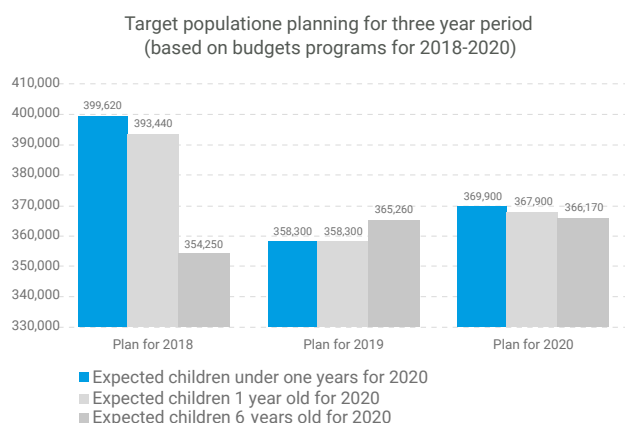
20. The lack of standardized approach and variable application of important demographic indicators, along with the lack of use of proper data sources, were further confirmed by some respondents:

“Population growth rate, infant and under-five mortality or other demographic indicators are not adequately used during target forecasting process. The annual targets are set retrospectively based on the [immunization] data from the last three years. And the rules on how to use the demographic indicators are not set out clearly. Thus, most of us, when we use these indicators, rely on our personal experience practice, which is largely variable”. **Oblast level respondent**

¹⁶ Agency for Strategic Planning and Reforms of the Republic of Kazakhstan Bureau of National statistics

21. For more rigorous analysis, we looked deeper at target population planning for 2020 using budget plans for 2018, 2019, and 2020, with the expectation that the sizes of the population were to be comparable if "standard" planning rules have been adhered to in the country. For such analysis, we compared three age groups of the EPI (a) number of children under one year; (b) one-year-old, i.e., surviving infants and (b) children under six years of age. The results of the analysis in Figure 4 reveals inconsistency in target setting for all age groups, which does not follow the logic of the national demography with increasing fertility and the growing number of births observed over the past decade. Sudden reduction in the number of under one-year-old children from 2018 to 2019 and slight growth in 2020 but with a lower number than reported by the national statistical office (see Figure 3 (left)) is a vivid example of weak target setting for EPI arising from the reasons noted earlier.

Figure 4 Consistency of Target Setting Across the Years



22. For target setting analysis we also compared regions and looked at targets for infants reflected in the Form N4 as a percent of the number of newborns reflected in the national statistical data. Figure 5 reflects the analysis and reveals that largely all regions, with the only exception of Akmola, are underestimating their targets for under one year old. The level of underestimation is greater in the Oblasts plotted on the left side of "X" axis (see Figure 5) and slightly better for the regions on the right. And finally, the chart reveals deteriorating trend of planning precision from 2018 to 2020 across almost all regions (with some exception). To conclude, it might be helpful to look at practices in Akmola to see how they manage high quality planning compared to others, which could afford interesting lessons for moving forward.

23. Finally, the study revealed unproductive collaboration between individuals and entities involved in the target setting for the immunization program.

"The parties involved in immunization planning, like Oblast Health Department and the Department of Sanitary Epidemiological Control, are communicating in case the target population figures in the list of Registered Population and figures provided by the health department are different. The communication is carried out through the official correspondence." **Oblast level respondent**

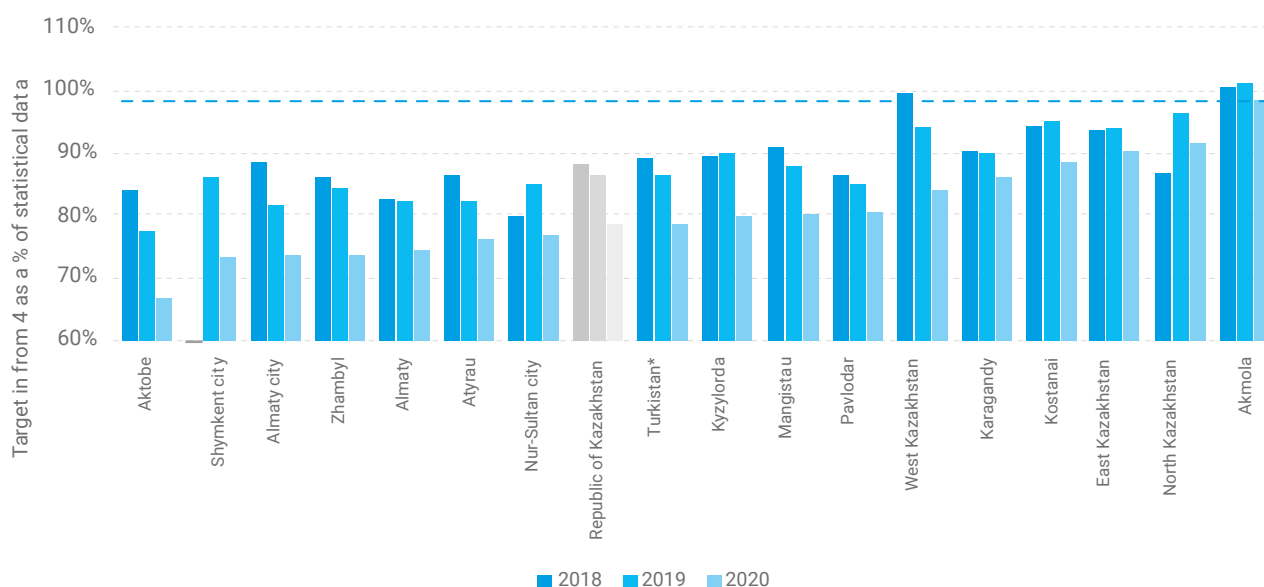
"Communication and collaboration between the health department, San Epid Surveillance Department, the Ministry of Health and SK Pharmacia is carried out through the official correspondence only." **Central level Respondent**

"The formal procedures at MoH and Oblast Health Departments are complicated. It takes more than a month to receive official letter or response." **Central level Respondent**

24. While quoted case(s) of collaboration could be seen as a promising practice, unfortunately, it does not produce expected results. Namely, outcomes of quoted collaboration do not produce better target estimates for the EPI program because they bear just formal character and do not seem to be results-oriented.

25. To conclude, it seems critical to (a) standardize the practice of population target setting; (b) revisit and adjust the critical data sources (choosing most reliable ones) that have to be used in the process; (c) require more collaborative work among oblast/city health departments, rayon health authorities and other key players on a central or local level when setting the targets for the annual vaccination plans and try to make this collaboration less formal and more team-work to set proper immunization targets for the oblast/city, achieve higher coverage and protect children from VPDs.

Figure 5 Regional comparison for target setting
Regional comparison of target setting for children <1 years



3.2. Quantification of vaccine requirements

26. When EPI targets are set adequately, the next area where challenges could occur relates to quantifying vaccine requirements for which the national vaccination calendar, the expected balance of vaccines at the end of the year, and vaccine-specific wastage factors are critical data elements along with the rules of quantification.

27. The national regulations, using the standard form for vaccine quantification, seem adequate to standardize practice, guide those involved in vaccine quantification, and produce reliable estimates about required vaccine doses. Furthermore, the reporting forms used in the system and collecting the data necessary for quantification seem to be producing quality data elements and facilitate the production of reasonable estimates. The only area of concern that could be noted relates to the **expected balance of vaccines towards the end of the year**. The current information flow about vaccine consumption is not digitalized. The information is collected and compiled manually using standard Excel forms, which are prone to

mechanical and human errors. To validate the information obtained from respondents about the practice and quality of vaccine quantification, the consultants, using internationally accepted rules, conducted an alternative quantification exercise presented in Figure 5. For this verification, we used the **target population sizes provided in MoH plans** and vaccine waste factors captured in Form N4. We compared obtained results with the number of vaccine doses planned in the 2020 budget. These estimates were closely aligned with the minimal discrepancy, most likely arising from different estimates for vaccine wastage factors used by the oblast health departments and us. Thus, **if target population estimates for EPI were correct, the vaccine quantification process and individuals can produce accurate estimates**. However, when the similar exercise was repeated using population targets obtained from the national statistical office, which are significantly higher than the ones used in EPI plans for 2020, the planned budget for 2020 was short of 622,000 doses of vaccines¹⁷ or about 9% of doses needed for the national EPI.

¹⁷ Includes all vaccines and all doses required for EPI.

3.3. Budgeting for Vaccine Procurement

28. The overall budgeting process for the health sector, including for vaccines, follows the national timeline for the republican budget development and includes the following steps:

By April 15:

- the Government approves a scenario for economic growth and the projections/forecasts of socio-economic development for five years (with budget indicators for three upcoming years).
- in parallel, vaccine quantification and forecast process for the coming three-year period is performed by oblast and republican city health departments along with budget estimates for the coming three years necessary for the vaccine procurement (using prices approved centrally for the year, called "maximum permissible price of previous year").

By May 15:

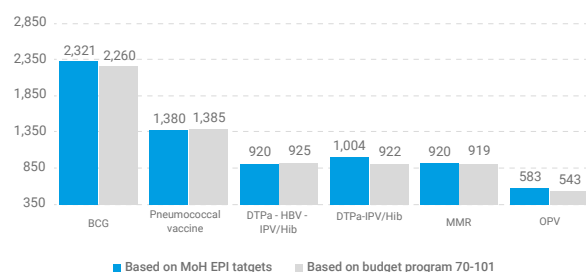
- MoH reviews preliminary vaccine and budget forecasts and consolidates them into the national health budget request.
- MoH submits a consolidated health budget proposal to the Ministry of Finance.

By September 1:

- MoF reviews budget submissions and requests clarifications where required and prepares the draft budget law for approval by the Republican Budget Commission.
- The Republican Budget Commission approves the draft law of the republican budget for three years; MoF submits the draft budget law to the Parliament for approval.

Figure 6 Vaccine Quantification Analysis

Comparative analysis of vaccine dose quantification for 2020
(1000 vaccine doses)



- At this stage, Oblast/city health departments are allowed to revise the preliminary vaccine estimates (based on the revised budget assumptions and the revised vaccine prices), and the oblast/city authorities approve the revisions.

By December 1:

- Parliament adopts the republican budget law and

By December 31:

- President endorses the republican budget law.

29. According to existing regulations^{18,19} oblast/city health authorities are granted the power to estimate the budget for vaccine procurement for their respective jurisdictions. While determining the budgets, respective authorities are guided with the prices per dose of vaccine determined by the National Center for Expertise of Medicines and Medical Devices (NCEMMD). The prices include producers' prices, shipping/freight, and distribution costs. Based on quantifications prepared by the oblast/city health authorities, the budgets for vaccine procurement are established and submitted to MoH and MoF and "SK Pharmacia." The state regulations for the budget estimate are closely followed by those charged with the

¹⁸ Order of the Minister of Health of the Republic of Kazakhstan dated December 11, 2020, No. ҚР DSM-247/2020 On the approval of regulation rules, the formation of price caps and markups for medicines and medical devices within the guaranteed volume of free medical care and (or) in the compulsory social health insurance.

¹⁹ Order of the acting Of the Minister of Health of the Republic of Kazakhstan dated June 13, 2018, No. 361 On approval of the Sanitary Rules "Sanitary and Epidemiological Requirements for Prophylactic Vaccinations of the Population."

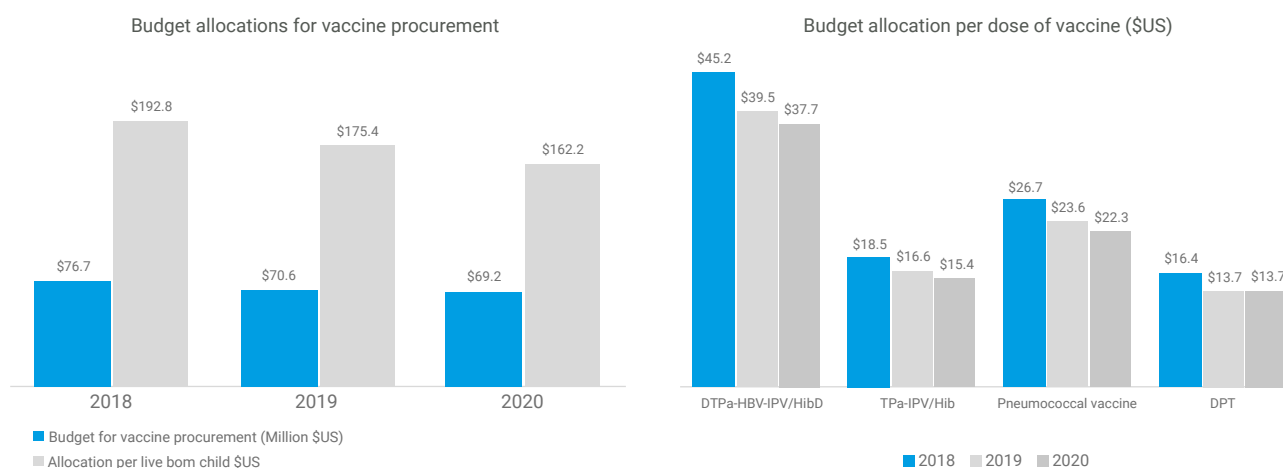
responsibility. Therefore, a proper budget estimate depends on appropriate quantification (discussed earlier in the report) and adequate price setting for the given vaccine, which also depends on the national currency exchange rate because all EPI vaccines are imported in Kazakhstan.

30. Consequently, to validate the appropriateness of the budget setting, and after collecting information from respondents, we looked at vaccinee budgets (included in Budget program 70-101) for the 2018-2020 period. We used detailed budget plans from MoH and data from the national statistical office and from the National Bank to convert budgets into \$US (the conversions were necessary to evaluate the sufficiency of funds for importing vaccines). The results of the analysis are presented in Figure 6.

31. The left side of the chart reveals that the overall amount of funds for vaccine procurement declined by 10% from 2018 till 2020, while the annual number of births in the country was growing. To reveal discrepancies arising from the growing

number of birth and declining vaccine budgets, we calculated budget allocations per live-born child (recognizing that vaccine budgets are for all age groups and not only for children and EPI, but the conversions provide a proxy measure for funding adequacy). The comparison (see Figure 6 left) reveals that allocations declined from 193 \$US per live-born child to 162 \$US in 2020 or by 16%, which the changing volumes of non-EPI vaccines cannot explain. Therefore, the drivers of observed decline could be (a) underestimation of target population noted earlier and (b) the national currency depreciation against \$US, which lost 20% of its value over three years. Furthermore, to validate our conclusion about currency devaluation, we looked at prices per dose of vaccine established by the National Center for Expertise of Medicines and Medical Devices presented in Figure 6 right. The chart reveals a significant reduction of prices in \$US for the selected vaccines, which was not the case for the study period as the prices in the world market grew.²⁰

Figure 7 Budget allocation analysis for 2018-2020



32. The state regulations²¹ for price-setting are explicit about necessary price adjustments that must be carried out for the medicines and vaccines if the national currency depreciates (or appreciates) against \$US **by ten or more percent within a**

month. While Kazakh Tenge lost 20% of its value against \$US, the devaluation never reached the 10% level **within a month**²² and therefore did not trigger (or maybe even prevented) the necessary price adjustments. Respondents confirmed these

²⁰ UNICEF supply division. Vaccines pricing data. <https://www.unicef.org/supply/vaccines-pricing-data>.

²¹ Order of the Minister of Health of the Republic of Kazakhstan dated December 11, 2020, No. KP DSM-247/2020 On the approval of regulation rules, the formation of price caps and markups for medicines and medical devices within the guaranteed volume of free medical care and (or) in the compulsory social health insurance.

²² Except during March 2020.

findings that price adjustments are permitted, although they were sporadic. All of this indicates that the current regulation for medicine/vaccine price setting is not flexible enough to account for slow and gradual changes in the exchange rate that may occur within a year and jeopardize vaccine procurement volumes. Furthermore, budget modifications are an administratively cumbersome process imposing disincentives for individuals involved.

"Theoretically, the budget could be revised in exceptional cases. The procedure requires up to one month. However, there were the cases when it has required more than eight months, as it was related to the long negotiation with the procurement company and local bureaucratic procedures." **Oblast Level Respondent**

"In 2015, MoF did not approve the budget revision request, and the country was not able to procure sufficient quantities

of Pentavalent vaccine, which led to the significant decrease of the DTP3 coverage rates (from 98% in 2015 to 82% in 2016)." **Central Level Respondent**

33. Based on all these findings, we conclude that even if population targets are set appropriately and vaccine quantification is correct, the next level of vaccine procurement and supply challenges may occur due to macroeconomic factors leading to national currency devaluation against foreign currencies for vaccines. Considering how burdensome or unproductive the budget revision process might be, the potential solution to this shortcoming might be to increase the size of a buffer stock currently set for a quarter to four months, if cold-chain capacity permits. However, such regulatory changes may not be required if the target setting for the population improves because, in this case, a buffer stock of three months could become sufficient to compensate for losses in vaccine quantities arising from the national currency depreciation.

3.4. Vaccine Procurement and Distribution

34. The "sole distributor" – SK Pharmacia is responsible for procuring EPI vaccines and distributing them throughout the country. Right after approval of the annual budget in December and based on the vaccination plans supplied by the MoH, SK Pharmacia embarks on vaccine procurement. Where SK Pharmacia has long-term contracts with the suppliers, the vaccines are shipped to Kazakhstan during March. However, the prices are not fixed in the long-term contracts and are reviewed at the beginning of each year, requiring some time. And where new procurement has to be conducted, SK Pharmacia embarks on the procurement immediately after the budget approval.

35. All vaccines arrive through the Almaty airport, as it is the only gateway having sufficient capacity to handle such operations. After arrival and customs clearance, there are four levels for vaccine distribution in the country. 1st level -

Airport Central Warehouse, 2nd level is the central vaccine stores; 3rd level - regional warehouses, and 4th level is health facilities - vaccination points. Compared with the pharmaceuticals, vaccines are not distributed to the regional hubs (4 big warehouses for storing buffer or security stocks) and are distributed directly to the 17 oblast/city warehouses. The responsibility to deliver vaccines from central to oblast warehouses rests with the SK Pharmacia, and shipments are made twice a year, following MoH's distribution plan. Thus, the responsibilities of SK Pharmacia with regards to vaccine distribution include receipt and customs clearance, central warehousing, and organization of vaccine distribution to the oblasts with the help of sub-contracted companies.

36. The next level of vaccine distribution from oblast/city warehouses to districts and then to health care facilities becomes the responsibility of

oblast/city health authorities who organize such deliveries to districts (usual stocks of vaccines are shipped to district polyclinics), and districts bear responsibility for further delivery to rural ambulatories and feldsher-ambulatory posts. At the oblast level, the responsible person for distribution is an epidemiologist working in the Oblast Vaccine Store guided with the vaccine distribution plans (see above). According to most respondents, health facilities usually collect vaccines from oblast warehouses themselves, using their budgets to cover transportation costs.

37. According to the data included in Form N3, "Report on the movement of vaccines and other immunobiological drugs," vaccine stockouts on a facility level are not infrequent, leading to unvaccinated cohort not protected against VPD diseases. A thorough exploration of the stockout root causes led to two bold areas that contribute to the problem. The first relates to vaccine supply to the country and the second vaccine distribution from oblast level to facilities. Both areas are thoroughly explained below.

38. According to respondents, there seem to be three main factors responsible for the vaccine supply shortages occurring on the national level, including (1) **Vaccine prices and budget development practices**. The budgets for vaccine procurement are developed for the three years in the national currency unit, but when the national currency depreciates, the allocated budget becomes insufficient to procure required doses of vaccines which then leads to vaccine shortages on a national scale. (2) **Changes in vaccine prices on the global market**, which requires revision of the country's three-year health budget, cause significant complications. (3) **Delays in vaccine delivery to the country**: usually caused by the inability of vaccine producers to provide required quantities of vaccine doses. Resolving obstacles (1) and (2) would require actions discussed earlier in the budgeting section. As for barrier (3), the problems

need further exploration and national discussion to identify potential solutions.

39. Three factors also explain the vaccine stockouts arising from problems related below oblast level distribution²³: (1) **weak systems for cold-chain management** leading to broken down refrigerators and vaccine destruction, (2) **weak vaccine stock management**, i.e., inadequate monitoring of expiration dates, and (3) **shortages in continuous power supply** that may lead to vaccine destruction.

40. Responsibility for controlling the cold-chain system is assigned to the CSEC and is performed once or twice a year using paper-based forms. After inspection, the CSEC produces a specific report on the cold-chain assessment. The information flow between facilities and CSEC about the status of the cold chain equipment and for vaccine management on a facility level does not meet the demands/expectations of the modern information systems, as it is prone to delays and mistakes. Therefore, until adequate electronic management information systems are implemented, Kazakhstan may need to tolerate the level of vaccine waste caused by cold-chain breakdown and vaccine expiration. Another solution might be to establish proactive notification requirements from a facility where out of order refrigerator is placed and develop immediate response mechanisms from oblast health administration aimed at timely replacing the equipment, conditioned that oblast health authorities have stock of spare refrigerators prepositioned for these purposes. With regards to power supply, the investment requirements might be more significant to equip facilities with large vaccine stocks with the power generators or consider replacement of existing equipment with the modern, WHO prequalified refrigerators and freezers with the longer hold-over time, if cost-benefit analysis for such investments proves the value of such capital outlays.

²³ НПЦСЭЭИМ. *Analysis on immunization for 2020 in the Republic of Kazakhstan*

3.5 Monitoring vaccine use and population coverage targets

41. In 2016 the Committee for Sanitary-Epidemiological Control (CSEC) was relieved entirely from the planning function to assume better its monitoring and control function over the immunization program and prevent the epidemic outbreak of vaccine-preventable diseases. CSEC primarily uses Excel™ based on two separate forms N3 and N4, to monitor vaccine use and population coverage. The forms are comprehensive in the content and provide extensive information necessary for undertaking this function.

42. An electronic health information system operating on a PHC does not monitor vaccine usage in the way it does for pharmaceuticals. Therefore, Excel™-based information exchange between facilities and CSEC proves outdated for real-time information flow. As a result, shortages of vaccine supplies on a facility level are not infrequent, and about 12% of unvaccinated children are due to vaccine shortages at the vaccination point. While vaccine exchange among districts/oblast is being used to mitigate challenges caused by the shortage, the system is not delivering on the expected results and requires more systemic resolution.

43. However, the second challenge, which falls beyond the scope of the assignment, plays an important role in having a sizable portion of children missing timely vaccination, relates to medical contraindications. Most respondents claim that antivaccine sentiments among parents are the primary reason for unvaccinated children. However, the thorough analysis of the form N4 reveals that in 68% of cases, reasons for not giving a child vaccine were temporary medical contraindications while permanent were only around 1%. The next most frequent reason was 12% due to lack of vaccines on a facility level, and refusals only were responsible for 7%. These figures represent national average which may hide significant sub-national differences. **Inquiring about the factors explaining the high prevalence of temporary medical contraindications was beyond the scope of this assignment. However,**

the consultants think they are important enough to be further investigated and programmatically addressed based on the study findings. Therefore, UNICEF CO and the Government are strongly encouraged to explore this phenomenon, evaluate sub-national differences, if any, identify important factors driving the numbers high and develop the needed interventions for their reduction. In principle, CSEC should play more active role in tracking the rate of temporary medical contraindications and where necessary propose or take corrective action. Furthermore, CSEC should also consider the cohorts of children that missed their vaccination either due to target setting, due to temporary contraindication or due to any other reason and propose inclusion of these cohorts in the national program targets, at least for 2022.

44. All respondents claimed that the monitoring system managed by CSEC functions adequately and meets EPI needs. However, **the VPD outbreaks occurring in Kazakhstan over past years, the weaknesses of population target setting, and budget estimation, high rate of medical contraindications and other weaknesses noted earlier in the document, all indicate that system functionality needs improvement by revealing and recognizing systemic weaknesses and addressing those timely.** Most likely, punitive management approaches – the legacy of the Soviet past, noted by many respondents, are still inherent in the system and present barriers for admitting the system weaknesses and then resolving them.

45. The findings uncovered in this report certainly are not news to Kazakhstan and for individuals involved in EPI. The consultants have come across the publications, and formal reports to the authorities admitting and highlighting the similar weaknesses of the EPI noted in this report.

"Simple comparison of the number of live births reported by the National Bureau of Statistics and the target population groups recorded in the Form No.4 "Report

of Vaccination Coverage” reveals 21.1% difference, indicating that system of quantification and forecasting on an oblast level fails to properly track and account for the newborns and children that must be reached with the immunization services²⁴.”

46. Similar weaknesses and more were mentioned in the formal reports prepared by CSEC²⁵. It seems corrective actions were either not taken by those in charge, or the COVID19 outbreak impeded/delayed the needed changes. Obviously, the system of monitoring vaccine use (described in the previous section) and monitoring of population coverage has weaknesses. While coverage rates could be "correct" due to low population targets set in the plans, the EPI does not deliver on public health objectives – preventing VPD outbreaks in the country. Therefore, until the systemic weaknesses

in the EPI are not timely recognized and then resolved, VPD outbreaks would impose high economic and societal costs on Kazakhstan.

47. Finally, it seems to be a common belief in Kazakhstan that if immunization coverage rates are not achieved (even with low population targets), this is primarily due to refusals and populations' anti-vaccine attitudes. However, a thorough analysis of Form N4 reveals that **refusals only explain 7% of non-vaccinated cases**, and principal reasons **are temporary medical contraindications – 68%** followed by vaccine stockouts – 12%.

48. Taken together, all of this indicates the need to enhance CSEC's systems and capacity for better monitoring of vaccine use and immunization coverage rates to avert VPD outbreaks, improve health and save lives.

²⁴ L.K. Kasabekova. Analysis of immunization for 2019 in the Republic of Kazakhstan. Scientific and Practical Center for Sanitary and Epidemiological Expertise and Monitoring. Journal of Environment and Public Health No.1, 2020

²⁵ НПЦСЭЭИМ. Analysis on immunization for 2020 in the Republic of Kazakhstan

4. CONCLUSIONS

49. Below we summarize our conclusions and link those to the roles and responsibilities of each entity involved in the EPI implementation. Such linkages (in our opinion) help reveal the areas that need improvement and eventually inform the Recommendations section of the report.

50. Healthcare Providers

- National regulations²⁶ mandate health care facilities to use the census data of the catchment population as a source for target planning, albeit this data source proves incomplete and underestimates the size of the immunization program.
- The electronic information systems operating on maternity/hospital and PHC levels are not interlinked, and information about newborns is not exchanged between these facilities. As a result, the number of newborns (according to Form No.4) vaccinated in the maternities with BCG and Hepatitis B significantly exceeds the number of children planned for vaccines administered only on a PHC level.
- The noted discrepancies above result from inadequate facility-level census information (most likely obtained from RAP) necessary to properly plan/estimate the size of the target population for EPI, which leads to underestimation on a local, rayon region, and national level.
- The low annual target for a facility, along with the high prevalence of temporary medical contraindication, while allows for reporting relatively "high immunization coverage rates" leads to accumulation of un-vaccinated cohort of children, which eventually contributes to epidemic outbreaks.

51. Oblast/city health departments

- While compiling plans from facilities, Oblast health departments are not charged (explicitly) with the responsibility to validate the targets using alternative data sources and/or validation tools and protocols. The practice seems to be reinforced with the restrictive regulations for vaccine planning¹⁶ which recognizes only one valid source for immunization planning - facility-level census data and does not explicitly allow/mandate the use of alternative (better quality) data sources. Consequently, responsible staff for target setting, operating in a rule-abiding and punitive work environment of Kazakhstan, prefers to follow the restrictive and, to a degree, inadequate rule using primarily facility-level census data that underestimates target population for the EPI program.
- Vaccine quantification practice followed by oblast health department seems adequate as we did not note significant weaknesses. Established practice is guided by the planning form, which implicitly imposes the data requirements for vaccine forecasting without supporting standard operating procedures (SOP). Consequently, the practice could be variable across individuals and is not prevented from calculation mistakes. However, the underestimation of required annual doses of vaccines observed in the system is the main reason for underestimating the target population and not because of vaccine quantification errors.
- While required doses for EPI are adequately quantified, estimating budget (required financial resources) follows centrally established rules and uses centrally set prices for a given vaccine dose²⁷. Interviews and analysis revealed systemic (rule-based) weaknesses of price

²⁶ Order of the acting Minister of Health of the Republic of Kazakhstan dated June 13, 2018, No. 361. On approval of the Sanitary Rules "Sanitary and Epidemiological Requirements for Prophylactic Vaccinations to the Population."

²⁷ Order of the Minister of Health of the Republic of Kazakhstan dated December 11, 2020, No. ҚР DSM-247/2020 On the approval of regulation rules, the formation of price caps and markups for medicines and medical devices within the guaranteed volume of free medical care and (or) in the compulsory social health insurance.

estimation and budgeting, which frequently lead to lower budgets than needed for vaccine procurement due to exchange rate fluctuations.

- The quantities distributed to each vaccination point (health facility) are based on the number of registered population and annual immunization schedule, which is an underestimate and frequently a reason for vaccine undersupply/shortages.
- Finally, an electronic health information system operating on a PHC does not monitor vaccine usage in the way it does for pharmaceuticals. Therefore, information exchange between facilities and rayon/oblast health departments is primarily Excel™-based, proving inadequate for real-time information exchange. As a result, shortages of vaccine supplies on a facility level are not infrequent, and about 12% of unvaccinated children are due to vaccine shortages at the vaccination site. While vaccine exchange among districts/oblast is being used to mitigate challenges caused by the shortage, thy systems are not delivering the expected results and require more systemic resolution.

52. The Committee for Sanitary-Epidemiological Control

- In 2016 the CSEC was completely relieved from the planning function to assume better its monitoring and control function over the immunization program and prevent the epidemic outbreak of vaccine-preventable diseases.
- CSEC primarily uses Form 4, prepared by facilities to adequately fulfill its monitoring role, albeit plans provided by facilities/districts/oblasts are accepted as is and target population, set out in the plans, are accepted as is without validation from alternative sources or questioning at the time of planning.
- While CSEC is aware of the planning shortcomings (underestimation of the target group) and issues have been routinely raised

(primarily on a national level) in the formal reports and information notes to superior entities or scientific publications published in Kazakhstan, the remedial actions have not followed, and as a result, CSEC had to deal with several VPD outbreaks of past years.

- Regarding monitoring the cold-chain and vaccine deliveries to facilities, CSEC better performs its functions/responsibilities with regards to monitoring vaccine use and reporting/data systems in place to monitor the cold-chain may not be entirely up to the standards demanded placed by new health management information systems.

53. SK Pharmacia

- Vaccine procurements through SK Pharmacia are relatively well organized, with rare challenges in the procurement process itself. And if supply gaps emerge primarily, they are due to budgeting or vaccine pricing. Rarely do challenges occur from a supplier side when shipment delivery occurs at the fault of a manufacturer/supplier or due to other factors emerging on a global vaccine supply chain/market.
- Distribution from central store to oblast/city warehouses functions well, without noticeable challenges, and most distribution-related challenges occur from oblast warehouse to facilities described in the report.

54. Ministry of Health

While MoH fulfills its functions well, its powers with regards to vaccine forecasting and procurement planning seem to be constrained due to the following circumstances:

- a. National regulations²⁸ only allow for one data source for target population planning – facility-level census data, which most likely prevents the MoH staff from using more professional approaches and alternative data sources for target setting and validation purposes.

²⁸ Order of the acting Minister of Health of the Republic of Kazakhstan dated June 13, 2018, No. 361. On approval of the Sanitary Rules "Sanitary and Epidemiological Requirements for Prophylactic Vaccinations to the Population."

b. Secondly, established practice for target group calculation, inherited from the Soviet past, has not been aligned with the current developments in information availability (e.g., improved birth and death registration by statistical office). MoH uses vaccine consumption over the past two-three years as a reference point instead of adjusting for demographic developments and projections. The unregulated practice of adjustment without proper SOP could be seen as a systemic weakness.

c. Planning for vaccination is Oblast level responsibility, and while MoH (based on the National Statistical Committee data) could

question the validity of annual targets for children, it is not being practiced due to various objective or subjective reasons, and the national legislation does not completely empower MoH to intervene/push the Oblast level health departments to increase the targets and consequently budgets²⁹ unless regulatory documents are amended.

d. While regulations allow for budget amendments in-between of a fiscal year, the process is highly bureaucratic and lengthy, a punitive operational environment of Kazakhstan that inhibits private initiatives and demotivates staff from acting.

²⁹ Code of the Republic of Kazakhstan on people's health and health care system

5. RECOMMENDATIONS

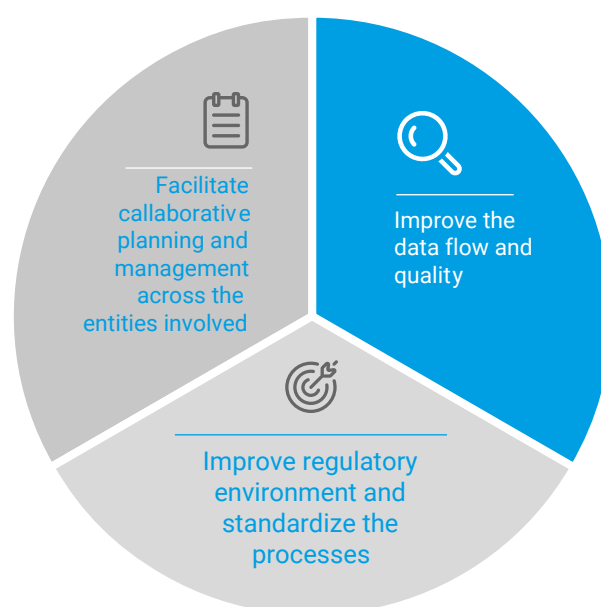
55. The presented analysis reveals that systemic weaknesses of EPI planning operate at a different level in Kazakhstan and require a comprehensive solution. Consequently, we have tried to group the recommendations around three overlapping and mutually reinforcing domains depicted in Figure 7 below.

56. **Improve data flow and quality:** the assessment indeed revealed weaknesses in data capture, exchange, and use, which have contributed to numerous areas of system weaknesses for vaccination planning. Consequently, Kazakhstan could improve several areas of the electronic information system or develop new ones should be introduced to achieve durable and sustainable improvements in the national immunization program.

56.1. Overall, Kazakhstan may want to completely re-design the immunization information system (IIS) to comprehensively resolve the challenges faced in target setting, information exchange between involved entities, vaccine planning, distribution and management, and vaccination coverage monitoring, etc. IIS re-design would require (a) **developing separate but also integrated modules** (elements) of immunization information system and (c) **integrating currently operating information systems** at least across hospitals and PHC but preferably across all entities dealing with personal or public health services. Such new immunization information system should include at least the following modules (but not limited to): (i) Immunization record of a person, a clinical decision-making tool, used to manage individual-level immunization service provision with the information about required vaccines, any temporary or permanent contraindications, history of administered doses, etc. (ii) immunization registry on a facility level to adequately manage patient appointments as well as immunization coverage rates among catchment population group(s); (iii) vaccine management module for improved vaccine planning, ordering, and consumption monitoring; (iv) cold-chain management module

on a facility level; (v) links to vital statistics for birth and mortality monitoring and/or the information exchange with the maternities to track newborns and their arrival to catchment area; (vi) various planning/budgeting and reporting modules enabling a facility to report to superiors on EPI performance on a facility level. Such a system should become an indefinite part of the electronic information system operating on a PHC level.

Figure 8 Three core domains of recommendations



56.2. While the development of IIS may take some years, authorities need to agree on the best sources of data for immunization planning that will be used for target setting and validation purposes. It seems the best quality data emerges from birth registration and national statistics, albeit it also has its inherent weaknesses. And maybe to add alternative sources for better quality data establishing data exchange requirements between maternities and PHC providers is the first step. **Identification and then the regulatory definition of alternative data sources for target planning and validation** would require extensive national consultation and consensus-building, that will also help IIS implementation in future.

57. Improve the regulatory environment and standardize the processes. Both IIS development and interim steps described earlier would require regulatory changes and practice standardization across the institutions involved in vaccine planning, procurement and supply, and immunization monitoring. Namely:

57.1. There seems to be a need to modify the decree N361 when data sources for immunization planning are identified and agreed upon because of the recommendation spelled in 53.2 above.

57.2. Also, it would be critical to explicitly determine the validation responsibilities of Oblast/city health departments, Ministry of Health, and the role CSEC should play in this process when agreeing on targets for EPI. CSEC should play important role in quantifying the cohorts of children that missed the immunization (due to temporary medical contraindication, due to lack of vaccine supplies or due to any other reason) and add those to the national targets for immunization gap elimination.

57.3. Regulations must clearly define the **mandates for timely notification** about out-of-order cold-chain equipment in the regulatory acts/decrees, and **responsible entities for timely cold-chain replacement** must be spelled out along with the maximum time allowed for replacement.

57.4. Collaboration across the involved entities could also be facilitated with the help of regulatory acts unless other means aiding cooperation are identified.

57.5. Authorities have to identify workable solutions to deal with the currency fluctuations affecting the volume of purchased vaccines. The solutions proposed in the report could be discussed and further expanded, and the agreement has to be adequately reflected in the respective regulatory acts.

57.6. Finally, detailed SOPs aimed at practice standardization for target setting, vaccine quantification, forecasting, and budget

estimation have to be thoroughly developed and effectively disseminated among those involved in the process on a facility, oblast/city health department MoH level.

58. **Facilitate collaborative planning and management across involved entities.** The experience of punitive management of EPI proves to be ineffective in Kazakhstan. Contrary it creates an environment in which people are afraid to reveal and discuss system weaknesses and propose constructive solutions for further discussions. The failure of current punitive management practices are well documented by **the VPD outbreaks occurring in Kazakhstan over past years, the noted weaknesses in the population target setting that were timely revealed but were left unattended, weaknesses in budget estimation leading to inadequate supply of vaccines in the bust that were left undiscussed, etc.** Thus, if the overriding objective for the Government is preventing VPD outbreaks and minimizing societal and economic costs of the epidemics (vividly revealed by COVID19), it becomes necessary to facilitate more collaborative planning and management while retaining clear lines of accountability for the entities involved. How collaboration can be encouraged should be discussed and agreed upon by the national stakeholders. As noted earlier in recommendation 54.4, some requirements/mandates could be spelled out in the regulatory documents. Albeit regulatory mandates risk facilitating formal compliance (as is the current practice) without tangible outputs instead of triggering genuine need among individuals to engage in the planning and management process collaboratively.

59. Finally, the government and UNICEF CO are recommended to **closely investigate factors explaining the high prevalence of temporary medical contraindication** and address identified issues programmatically, based on the study findings. While exploring this phenomenon it will be necessary to evaluate sub-national differences, if any, identify important factors driving the numbers high and develop the needed interventions for their reduction.

6. ANNEX 1

The list of reviewed documents

1. "A Situation Analysis of Children in Kazakhstan" – UNICEF, 2019
2. "An Analysis of Entering the Kazakhstan Pharmaceutical Market: The Case of Alkaloid" – Master's Thesis – Vladimir Blazhevski, September 2014
3. "Promising Practices in Quantification: Forecasting and Supply Planning" – Supply and Awareness Technical Reference Team (TRT) of the UN Commission on Life-Saving Commodities for Women's and Children's Health (the Commission or UNCoLSC)
4. "Vaccine Planning and Forecasting" – Aurelia Gasca, UNICEF, 2019
5. 2018 Budget Execution Report <https://data.egov.kz/> Accessed May 6, 2021
6. ADB, Asian Vaccination Initiative; Kazakhstan and Kyrgyz Republic National Immunization Program financing assessment, 2002
7. Allain, Linda, Jarrod Goentzel, James Bates, and John Durgavich. 2010. Reengineering Public Health Supply Chains for Improved Performance: Guide for Applying Supply Chain Segmentation Framework. Arlington, Va.: USAID | DELIVER PROJECT
8. Altyn Aringazina, Gabriel Gulis, John P. Allegrante, Public Health Challenges and Priorities for Kazakhstan; Central Asian Journal of Global Health, Vol 1, No 1 (2012)
9. BMI, Kazakhstan pharmaceuticals and healthcare report, 2014
10. EPI Logistics Forecasting Tool – UNICEF, 2018
11. Health Systems in Transition (HiT) – Kazakhstan Health System Review – Vol. 14 No. 4 2012 – The European Observatory on Health Systems
12. <https://pharm.reviews/dokumenty/item/5527-postanovlenie-pravitelstva-rk-ot-24-sentyabrya-2020-goda-612>
13. <https://www.trade.gov/country-commercial-guides/kazakhstan-healthcare>
14. Immunization Forecasting Tool – UNICEF
15. Kazakhstan and Kyrgyz Republic National Immunization Program – Financing Assessment – Asian Vaccination Initiative – ADB
16. Kazakhstan Multiple Indicator Cluster Survey (MICS) 2015 – Statistical Committee Kazakhstan, United Nations Population Fund (UNFPA), UNICEF 2017
17. Kazakhstan UNICEF Annual Report – 2017
18. Law of the Republic of Kazakhstan No 361 of December 4, 2002 "On Sanitary-Epidemiological Welfare of Population"
19. Measles in Kazakhstan: Overview of the Health System and Root Cause Analysis of the 2019-2020 Outbreak – UNICEF Kazakhstan, 2021
20. OECD Reviews of Health Systems: Kazakhstan 2018
21. Reforming Health Care in Kazakhstan – World Report – www.thelancet.com Vol 383, June 28, 2014
22. Root Cause Analysis of the 2019 Measles Outbreak Occurred in the Republic of Kazakhstan, UNICEF, 2021
23. Routine Immunization in Kazakhstan – WHO EURO – 2017
24. Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. 2014. Promising Practices: Procurement. Arlington, VA: Management Sciences for Health.

25. The Stages of the Healthcare System Reform of the Republic of Kazakhstan – A.Zhatkanbayeva, Daniyar Saipinov, Elsevier, 2014
26. UNICEF Vaccine Planning & Forecasting, Aurelia Gasca, Contracts Manager, April 11, 2019
27. WHO Immunization Analysis and Insights <https://www.who.int/teams/immunization-vaccines-and-biologicals/immunization-analysis-and-insights/surveillance/monitoring/provisional-monthly-measles-and-rubella-data> Accessed on May 5, 2021
28. Zhuzzhasarova A., Bayesheva D., Turdalina B., Aimahanbetovna A. Epidemiological situation of measles in the Republic of Kazakhstan. International Journal of Infectious Diseases Volume 101, SUPPLEMENT 1, 366-367, December 1, 2020. DOI:<https://doi.org/10.1016/j.ijid.2020.09.962>



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