KfW Development Bank

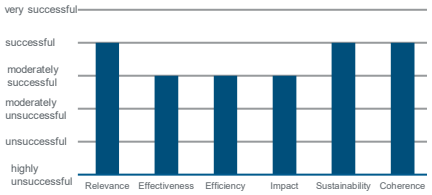
Ex-post-Evaluation
Vaccination Program Funding, Pakistan

Title	Vaccination program funding in Pakistan in cooperation with the Global Vaccine Alliance (Gavi), Phase 1		
Sector and CRS-Code	Health, family planning, HIV/AIDS (12550)		
Project Number	2016 67 781		
Commissioned by	German Ministry for Economic Cooperation and Development (BMZ)		
Recipient / Project Executing Agency	Global Vaccine Alliance, Gavi		
Project Volume / Financial Instrument	Euro 10 million, FC Grant		
Project Duration	2016-2017		
Year of Report	2022	**Year of Random Sample**	2021

Objectives and project outline

The revised outcome objective is the reduction of vaccine preventable disease through contributing to nationwide vaccination coverage of all newborns according to the vaccination calendar with pentavalent and pneumococcal vaccine and children under 5 not vaccinated accordingly. At the impact level, the objective was the improvement of the health of the population of Pakistan, considering children under 5 in particular. The project provided funds to Gavi for the procurement of pneumococcal and pentavalent vaccines in 2016. These vaccines were administered through established Gavi/UNICEF support to the Pakistani Expanded Program on Immunization.

Overall Rating:
Moderately Successful



Key findings

The project was highly relevant and effectively supported the Pakistani childhood immunization program. It is plausible that it contributed to reductions in child mortality for both boys and girls. The project is rated as "moderately successful":

Coherence (successful): The project fit into the German development cooperation portfolio in the health sector in Pakistan and synergies with government priorities were strong.

Effectiveness (moderately successful): Neither of the outcome indicators were met but vaccination coverage rates improved for both supported vaccines. Equity remains a challenge.

Efficiency (moderately successful): Immunization of children under 5 is a highly cost-effective health intervention. Even though procurement was highly efficient, efficiency at the operational level can still be enhanced. Annual tranches of bilateral, earmarked funding raise Gavi transaction costs.

Impact (moderately successful): At current rates of reduction Pakistan will miss the target of a child mortality rate of 25 per 1,000 live births in 2030 (SDG) by a wide margin. But there have been significant improvements and it is plausible that the project contributed to it.

Sustainability (successful): Vaccinations are for life and are inherently sustainable. Threats to the sustainability of the immunization program include potential economic and political volatility and decreasing donor funding.

Conclusions

- Equity in coverage is crucial in immunization programs, therefore monitoring (and management) should be based on indicators disaggregated by gender and other relevant criteria (e.g., urban/rural, regional, poverty).
- The efficiency of implementation could be enhanced through the provision of multilateral, unearmarked funding to Gavi, minimising transaction costs.

Ex post evaluation – Rating according to DAC criteria

Framework conditions and classification of the project

The Financial Cooperation (FC) project under review here was undertaken in Pakistan in 2016, although funding was disbursed retrospectively in 2017. It was the first phase of a two-phase immunization project in Pakistan, financed with parts of the bilateral funding from Germany's pledge of EUR 600 million for Gavi, the Global Vaccine Alliance, made by Chancellor Angela Merkel in January 2015 to cover the period 2016-2020.

The project was executed through Gavi, a globally active public-private partnership with its headquarters in Geneva. Its 2021–2025 mission (similar to the time of the project appraisal) is to save lives and protect people's health by increasing equitable and sustainable use of vaccines[1].

Gavi's partners include governments in industrialised and developing countries, the World Health Organisation (WHO), the United Nations Children's Fund (UNICEF), the World Bank, the Bill & Melinda Gates Foundation, non-governmental organisations, vaccine manufacturers from industrialised and developing countries, health care and research institutions, and other private donors. Germany's Federal Ministry for Economic Cooperation and Development (BMZ) is represented on Gavi's Board and in various working groups. Gavi is seen as an operationally and fiscally sound partner. In the 2022 Aid Transparency Index, Gavi was listed in eighth place among 50 development organisations.

Gavi is a vertical program that focuses on fighting specific diseases. It is not integrated into the health care system but provides financing for national vaccination programs through a parallel system of financing and procurement. Gavi bundles donor and counterpart contributions and ensures the availability of sufficient funding while UNICEF procures the vaccines.

Responsibility for implementing the national immunization program in Pakistan lies with the Ministry of National Health Services, Regulations and Coordination (MNHSR&C) specifically the Expanded Program of Immunization (EPI) Management Unit which was established in 1978. Vaccinations are given by EPI personnel and administered through EPI's network of provincial and regional offices. Since 2010 Provinces have been responsible for the financing of immunization and for planning and managing their own provincial budgets for EPI.

This division of labour ensures that vaccines are available in a timely manner and in sufficient quantities and maximises the use of national systems. Gavi supports the provision of vaccines and related medical consumables, training measures, and maintenance of the cold chain.

Brief description of the project

The objective of the FC project was to reduce child mortality in Pakistan by contributing to vaccinations under the national immunization program of pentavalent[2] and pneumococcal vaccines. The contribution was through a bilateral commitment of EUR 10 million for Pakistan's EPI to Gavi. This was to support routine immunization for children up to 12 months, and children up to the age of 5 who did not have sufficient vaccination protection. The FC funds were earmarked for vaccine procurement and related costs, specifically the procurement of single-use syringes, cannulas and disposal containers required for the administration of vaccines and transport and insurance costs.

[1] Gavi is guided by four strategic goals: the vaccine goal to introduce and scale up vaccines. The equity goal to strengthen health systems to increase equity in immunization. The sustainability goal to improve sustainability of immunization programs. The healthy markets goal to ensure healthy markets for vaccines and related products.
[2] Pentavalent is a 5 in 1 vaccine including: diphteria, tetanus, whooping cough, hepatitis B and Haemophilus influenza type B (Hib)

Breakdown of total costs

The total costs of the project were based on the available financing volume. Therefore, there are no deviations between planned and actual figures.

Figure 1: Planned and actual costs of the project[3]

	Projects (planned) EUR[4] million	Projects (actual) EUR million
Total investment costs (vaccine procurement)	100.67	100,67
Government of Pakistan (GoP) contribution	28.6	28.6
Other Gavi contribution	62.07	62.07
FC funding	10.0	10.0

Source: KfW Project documentation and Gavi Pakistan Co-financing Factsheet 2021

[3] These figures are for all routine immunization, but for vaccine costs only. Importantly the proportion contributed by the government of Pakistan is significantly higher when non-vaccine cost of immunization (e.g. transport, cold chaines, consumables but also training) are included.

[4] According to an exchange rate at 1 EUR = 1.180 USD on the date of payment December 11th 2017.

Rating according to DAC criteria

Relevance

Alignment with policies and priorities

The FC project objective is aligned with several global policies and priorities. Foremost among them is Sustainable Development Goal (SDG) 3 of 2015 which is to ensure healthy lives and promote well-being for all. SDG 3 sub-goals are relevant to this evaluation including, by 2030, ending preventable deaths of newborns and children under 5 (U-5s), with all countries aiming to reduce the mortality of children U-5s to at least 25 per 1,000 live births; and providing access to safe, effective and affordable essential medicines and vaccines. The project is equally supportive of the international immunization program as captured in *Immunization Agenda 2030: A Global Strategy to Leave No One Behind*.

According to the WHO, immunization currently prevents 3.5-5 million deaths every year[5] from diseases like diphtheria, tetanus, pertussis, influenza and measles. It is a key component of primary health care. The Gavi mission is also consistent with global goals in immunization. At the time of the project appraisal in 2016 the Gavi mission was to save children's lives and protect people's health by increasing equitable use of vaccines in low-income countries (LICs).

The FC project addressed a clear need. In 2016 Pakistan suffered high rates of U-5 mortality at 74 per 1,000 live births compared with a regional average of 57 per 1,000 live births in South Asia. It was the second highest rate in the region after Afghanistan and more than half of these deaths were caused by vaccine preventable diseases.

A report just prior to project commencement noted that Pakistan was third among countries with the most unvaccinated and under-vaccinated children worldwide. Of the 3.8 million infants in the region in 2015 who did not receive their third dose of Pentavalent (DTP3) vaccine, 40 % were in Pakistan (WHO/EMRO, 2016). Additionally, the National Demographic and Health Survey (DHS) reported that only 54 % of children aged 12-23 months surveyed in 2013 were fully immunized (National Institute of Population Studies, 2013). A target of 90 % is recommended[6] by the Global Vaccination Action Plan 2011-2020.

There was a high need for additional financing. The EPI 2016-2020 funding requirements added up to EUR 3 billion (USD 3.472 billion). The funding gap (without cost recovery) estimated at the time of the appraisal of the FC project amounted to USD 1.17 billion when taking into account secured financing (Gavi/Government of Pakistan (GoP), comprehensive Multi Year Plan (cMYP 2016-2020)). The GoP provided 32.8 % of the 2016 routine immunization budget and 25.3 % of the vaccine cost.

This project was fully aligned with the national development objectives of Pakistan. Pakistan's 12th Five Year Plan included as priority targets: the reduction of the infant mortality rate; the reduction of the child mortality rate; and immunization of all children from 0 to 23 months.

Alignment with needs and capacities of persons concerned

The primary target group was newborns in their first year of life. The broader target group included unvaccinated child under the age of 5. Children were to be selected solely by age and vaccination status without reference to income, gender or ethnicity.

FC project objectives were focused on the developmental needs and capacities of the target group. Vaccination deficiencies were correctly identified as one of the primary challenges facing U-5s and the approximately 6 million babies born annually in Pakistan. The project was explicitly designed with equity in mind since both gender equity and regional equity are built into the Gavi model (Gavi Annual Report 2021) and were foreseen to be monitored through the EPI program. While the FC financing was mainly focused on the procurement of vaccines, the broader Gavi support included measures to strengthen national implementation capacities of the EPI in areas with identified need of support (see Suitability of project concept for more details).

[5] WHO https://www.who.int/health-topics/vaccines-and-immunization#tab=tab_1 accessed September 13, 2022
[6] The Global Vaccine Action Plan 2011-2020 has the following target: by 2020, coverage of target populations should reach at least 90 % national vaccination coverage and at least 80 % vaccination coverage in every district or equivalent administrative unit for all vaccines in national immunization programs.

BMZ was and is aware of the governance challenges in Pakistan. Pakistan's political sphere and administrative bodies are characterized by a lack of transparency, corruption, and players pursuing vested interests. In the Corruption Perceptions Index (CPI), Pakistan slipped from 117th out of 180 countries in 2017, to 140th out of 180 in 2021. With the difficult governance environment in mind, the project design sought to circumvent these challenges by working through Gavi and UNICEF. However, it is part of Gavi's model to work with local institutions in this case the MNHSR&C (for easier reference in the following referred to as Ministry of Health (MoH)) and the national EPI which involves operational risks.

Suitability of project concept

The Theory of Change (ToC), even though not explicitly articulated in the project appraisal, was plausible at appraisal stage. Through contributing to the availability of more quality vaccines (inputs) for an increase in vaccination coverage rates (VCR) (outcomes) the FC project intended to contribute to the reduction of vaccines preventable diseases and through this the reduction of the U-5 child mortality rate (CMR) (impact).

The underlying assumptions were as follows: the provision of vaccines would be arranged through a trusted, efficient and highly economic procurement agency (UNICEF); the oversight of the project would be carried out by Gavi, with a sterling international reputation for performance, commitment to equity, and fiduciary care; that the immunization program on the ground would be carried out by the Pakistani EPI which had many years of experience and a deep subnational reach, albeit facing some important and known challenges; that the use of well-established systems would provide the greatest possibility of success; and that the challenges in human resource quality, transport and cold chain could be rectified, overcome or circumvented.

The concept of the FC project did not consider alternative approaches simply because there were no viable alternatives. Working with Gavi and the MoH and the EPI program was and is really the only way to solve the critical problem of low vaccination.

The FC project considered sustainability from the outset. It recognized that vaccinations of children are inherently sustainable since they provide lifelong protection from disease. The appraisal document also recognized the economic sustainability issues of the EPI program. It reported that government financed one third of the annual costs of the EPI program and this was expected to increase over time in line with Gavi's graduation policy (see Sustainability for more details). However, it was acknowledged from the outset that immunization would continue to require significant financial support from external donors.

Within the scope of the ex-post evaluation (EPE) the outcome and impact objectives were revised to clearly reflect the different levels in the results framework and be more specific concerning actual targeted beneficiaries. The indicators were adapted respectively, and a further disaggregation proposed to enhance their informative value in view of equity monitoring and management (for details see Effectiveness, Impact as well as Annex 2).

The concept did not explore the political dimension which determines the wider environment in which the activities took place; nor the causes of the challenges that emerge in data collection, for instance. It assumed that 'well established' reporting structures and existing delivery mechanisms would be sufficient.

At project appraisal specific risks and challenges facing the FC project as included in the Gavi/GoP cMYP 2016-2020 were identified as follows: security and poor law and order conditions particularly in the provinces Khyber Pakhtunkhwa (KP), FATA and Balochistan; natural disasters; political interference, in staffing in particular; social and cultural barriers (except Sindh and Punjab); illiteracy and poverty. Risks and assumptions of a more technical nature are also listed in the concept, including maintenance of cold chain structure and availability of qualified staff. However, in itemizing these risks it is recognized that Pakistan is a very large country. Provinces have differing characteristics, beliefs and practices, and risks cannot easily be generalized.

There are no environmental issues associated with the project, and thus no environmental risks.

Reaction to changes/adaptability

There has not been any revision or supplement to the initial concept.

Rating summary:

The FC project responds directly to the core problems: high levels of child mortality in Pakistan, and very low levels of vaccine coverage. The project is wholly aligned with the policies and priorities of the global and national

communities, as well as with the needs and capacities of beneficiaries. The project concept is well designed and takes advantage of proven and well-established systems. The relevance is therefore rated as successful.

Relevance: 2

Coherence

Internal coherence

Originating from a pledge by Chancellor Angela Merkel in 2015, the FC project had authorization from the highest level of German Government and added to the existing FC portfolio in the health sector in Pakistan. At the time the project was initiated, FC supported blood banks, polio immunization and family planning activities in Pakistan and could rely on established relationships with the MoH. KfW took part in the Gavi Joint Appraisal.

BMZ is responsible for developing the guidelines and strategies for German development policies to support the reduction of global poverty. However, during this evaluation no information was made available on German country or sector strategies for the relevant period. Nonetheless, the FC project was fully harmonized with SDGs and the international norms to which Germany subscribes, as indicated in the section on Relevance above.

External coherence

The FC project contributed to an on-going and well-established immunization program in partnership of the Gavi, UNICEF and GoP. National immunization programs in Pakistan have been in place since the late 1970s and the current Gavi/EPI system was developed closely with MoH and EPI under a Gavi grant proposal. The contract with KfW was signed by both Gavi and the GoP. FC funds went through Gavi to UNICEF for procurement of vaccines which were then provided to MoH for its EPI program. Gavi/GoP multi-year plans provide a framework within which Gavi could plan for and receive financial support for the procurement of vaccines.

The EPI program itself is implemented through its subnational offices and more than 6,000 EPI Centres which are integrated with provincial government structures at clinic level.

Gavi receives funds from many sources and applies them to national immunization programs such as Pakistan's EPI in accordance with approved grant applications. The Gavi program design, and likewise the FC project, were fully coordinated with other donors. The coordination of the national immunization program and other activities in the health sector is carried out by the Inter-agency Coordination Committee (ICC), in which all relevant actors from government, donors and civil society are represented. In November 2016, the World Bank managed Multi Donor Trust Fund (MDTF) "Pakistan National Immunization Support Project" (NISP) started, channeling donor financing to the EPI (a.o. by United States Agency for International Development (USAID), Bill and Melinda Gates Foundation (BMGF) but also Gavi a.o. for the Health System Strengthening). The NISP used Gavi/GoP objectives and planning and Gavi assured coherence and additionality with the NISP. The procurement of vaccines funded by NISP as for Gavi were implemented through UNICEF and administered by the national EPI.

Gavi works closely with partners WHO and UNICEF to monitor immunization outcomes, and WHO/UNICEF publish regular summaries of data by vaccination type[7] in addition to MoH's own monitoring processes.

As can be seen from the above the program was designed to use existing systems and structures.

Rating summary:

The project arose from a global initiative of the German Government. In the case of Pakistan, it added to the FC health sector activities. Synergies with government priorities were strong. The project's external coherence was

[7] The WHO and UNICEF estimates of national immunization coverage (WUENIC) system evaluates the reliability of government data, compares them to other data/surveys, and publishes all the data and trends so that observers can assess the statistics for themselves.

strong, and benefitted from its support of an existing, well-established and well-coordinated immunization program. Therefore, Coherence is rated as successful.

Coherence: 2

Effectiveness

Achievement of (intended) goals

The revised outcome objective is the **reduction of vaccine preventable diseases through contributing to the nationwide vaccination coverage of all newborns according to the vaccination calendar with pentavalent and pneumococcal vaccines and U-5s not vaccinated accordingly** (also see Annex 2).

The EPE considers vaccination coverage rates (VCRs) appropriate outcome indicators. However, as equity in coverage is crucial (a.o. to achieve herd immunity), they should incorporate data disaggregation by gender, region, poverty, ethnicity etc. to constitute an adequate basis for equity monitoring and management. Outcome indicators therefore should be expanded under the EPE to include gender disaggregation; unfortunately, no data has been made available during the evaluation (also see Annex 2). The achievement against the set targets is summarized in the following table:

Figure 3: Achievement of intended objectives at outcome level[8]

Indicator – vaccination coverage rate	Status at project appraisal (2016)	Target value from project appraisal	Status at final report (2019)	Status at EPE (2022)
1 Pentavalent	**72 %** (2015, WUENIC)[9]	**85 % in 2018** (cMYP 2016-2020)	**80 %** (2018, WUENIC)[10]	**83 %** (2021, WUENIC) Target not reached
2 Pneumococcal	**72 %** (2015, WUENIC)	**85 % in 2018** (cMYP 2016-2020)	**81 %** (2018, WUENIC)	**83 %** (2021, WUENIC) Target not reached

Source: KfW project documentation; WHO/UNICEF estimates of national immunization coverage (WUENIC) 2015; WUENIC 2020

Figure 3 demonstrates that outcome indicator targets planned for 2018 regarding vaccination coverage were not achieved:

- For the pentavalent a coverage rate of 80 % was reached by 2018 compared with a target of 85 %.
- For the pneumococcal a coverage rate of 81 % was reached in 2018 against a target of 85 %.

However, a significant increase in coverage rates for both supported vaccines has been achieved since the start of the FC project. The coverage rate for pentavalent rose from 72 % in 2015 to 80 % in 2018 and 83 % in 2021; and for pneumococcal it similarly rose from 72 % in 2015 to 81 % in 2018 and 83 % in 2021. The EPE cannot define whether the targets set were just too ambitious in view of the challenging context. However, the national data tended to overestimate achievements.

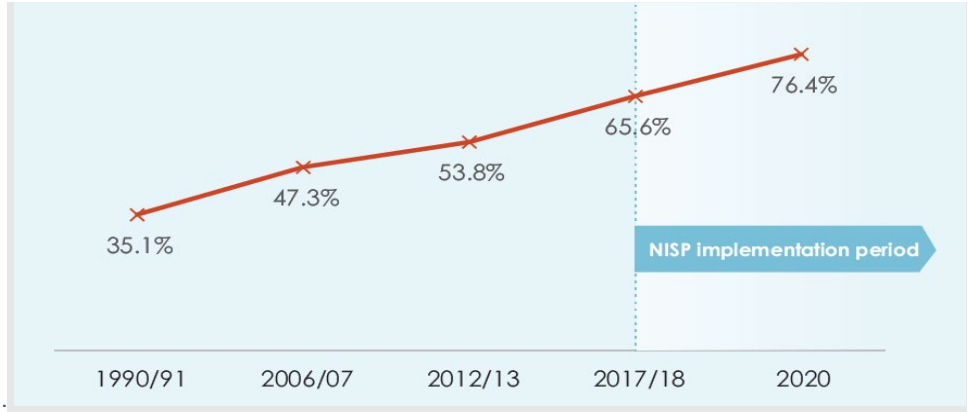
Immunization coverage rates had declined during the COVID-19 pandemic: pentavalent by 1 percentage point to 82 % in 2020 and pneumococcal by 7 percentage points to 77 % in 2020 (WUENIC 2022). Against the global trend of "the largest decline in childhood vaccination in 30 years", Pakistan quickly returned to pre-pandemic

[8] All vaccination coverage rates refer to "fully vaccinated" and provide the percentage of the target population that has received all recommended doses of a vaccine as recommended by the vaccination schedule.
[9] The FC project appraisal referred to cMYP data for 2015 which only slightly differed from the here applied WUENIC: pentavalent and pneumococcal coverage rates were reported at 73 % each.
[10] The FC final report referred to cMYP data which estimated pentavalent coverage rate in 2018 at 75 % and pneumococcal coverage rate at 79 %.

levels of coverage. According to UNICEF this was thanks to a high level of government commitment and significant catch-up immunization efforts (UNICEF, July 2022).

Additional data collections further reflect a longer-term positive trend in vaccination coverage, most notably the five-yearly Demographic Health Survey (DHS) (National Institute of Population Studies, 2019) and the more recent Third Party Verification of Immunization Coverage Survey (TPVICS) for the NISP illustrated in figure 5 below.

Figure 5: Proportion of fully immunized children in Pakistan, 1990 to 2020

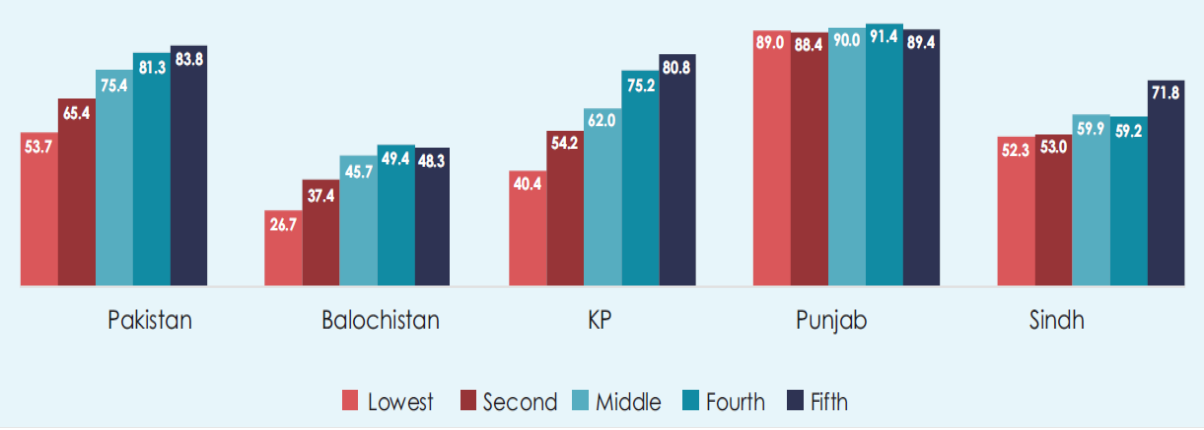


Source: TPVICS for 2020 data and the Pakistan Demographic and Health Survey (PDHS) for all other years

The 2017-18 DHS reflects an increase in fully vaccinated children of 12 to 23 months from 54 % in 2012/13 to over 66 % in 2017/18, and subsequent TPVICS data provides evidence for the continuation of this positive trend (76.4 % by 2020).

Vaccines are administered free of charge and equality of access is regularly monitored in a number of different dimensions including, by region, by wealth quintile and by gender[11]. However, equity in vaccine coverage in Pakistan remains a challenge a.o. due to deep seated socio-economic and geo-political factors and biases (logistical and/or institutional) of the national health service. The poorest people and people in the most remote areas, along with children of mothers who are the least educated, continue to be the least likely to be vaccinated. The significant variations between provinces and between wealth quintiles are demonstrated in Figure 6 below:

Figure 6: Percentage of children (12–23 months) fully immunized, by wealth quintile in 2020



Source: TPVICS 2020

Regional disparities in 2020 were ranging from 48.3 % fully immunized children in the highest wealth quintile in the remote region of Balochistan, bordering Afghanistan and Iran, compared to 89.4 % in the central and wealthiest region of Punjab and 83.8 % in Pakistan overall. Inequalities in terms of vaccination status of different income groups also greatly depend on regional characteristics. While in Balochistan only 26.7 % of children in the lowest

[11] This is carried out through Demographic and Health Surveys (latest 2017-18) and more recently through the TPVICS Survey Reports (2020 and 2022) carried out under the NISP.

quintile are fully vaccinated, and in KP the difference between lowest and highest quintile is more than 40 percentage points, in the central region of Punjab there is not much difference between the highest and lowest wealth quintile in terms of vaccination status.

The DHS 2017-18 reported that 69 % of children of first-, second-, and third-order births received all basic vaccines in contrast with 50 % of children of order 6 or higher. It also reported that, at that time, girls were slightly less likely to receive all basic vaccines than boys (63 % and 68 %, respectively). However, by 2020 there was no longer a noteworthy variation by gender, with 76.6 % of female children and 76.2 % of male children fully vaccinated (World Bank, 2022) so equity in view of gender was enhanced. Similarly, there was no rural–urban divide, with 76.2 % of children fully vaccinated in rural areas in 2020 compared to 76.7 % in urban areas, for Pakistan overall.

It is not possible to say which access barriers predominate these disparities. The vaccination itself is free of charge; however, transportation costs or taking time of work to be able to bring children to the vaccination might be relevant opportunity costs. Dropouts prior to full vaccination also are reported to be related to limited awareness.

Contribution to goal achievement

To quantify the contribution made by the FC project to the outcome objectives, some plausible assumptions must be introduced. It is reasonable to suppose that the FC contribution to the increased vaccination coverage rates in pentavalent and pneumococcal was in proportion to the resources provided. The 2016 contribution of EUR 10 million corresponded to approximately USD 11.80 million[12]. The total amount spent on vaccines in 2016 was USD 118.80 million (Gavi, Co-financing report, 2019) so that we can see the contribution to EPI vaccines was 9.9 %.

Vaccines procured with FC funds were as follows: 3,126,409 pneumococcal and 1,733,693 pentavalent vaccines as well as medical disposables needed for administering vaccinations (also see project description above). However, it is not known how many of the procured vaccines were administered to children after accounting for wastage, nor how many children benefited since some children receive multiple doses.

The primary project internal factor that was decisive in raising VCRs was the existence of well-established procedures between Gavi, UNICEF and the EPI. It is not possible to definitively determine the primary external factors. Likely causes were the financial commitments from the World Bank managed Pakistan National Immunization Support Program (NISP) starting in November 2016 which until mid-2022 had disbursed USD 65.5 million[13] (MDTF, grant funding) but also the commitments of the GoP; the levels of donor coordination and the steady improvement of the cold chain.

Several external factors hindered the achievement of goals, but the relative significance of each cannot easily be determined. There were numerous implementation challenges. At FC project appraisal, serious deficiencies in the cold chain, including that 17 % of refrigerators were defective and 28 % more than 10 years old, were reported. Later there are reports that investment had reduced cold chain problems (KfW reports). The 2018 Joint Annual Review (Gavi, 2018) reported several challenges including: difficulties with the pooled procurement mechanism; fund flows especially in KP and Balochistan; delays in recruitment of senior staff at the Federal and Provincial levels; several bureaucratic bottlenecks; a need for more clear strategies and operational plans to reach the systematically missed children and marginalized families; and need for stronger program oversight, monitoring and reporting.

It World Bank reported that the governance of the program had been made more complex by the constitutional change in 2010 which made provinces responsible to plan and manage their own budgets for EPI, and to support the costs of implementation, resulting in “five more or less independent EPI programs in Pakistan– one for each of the four provinces, and a national program supporting service delivery in the federally administered territories” (World Bank, 2016). They added that actors were still adjusting to the new arrangements; that the main barriers to improved routine immunization performance were not primarily financial but systemic; and that program governance and accountability mechanisms were weak and fragmented between federal, provincial and district

[12] According to an exchange rate at 1 EUR = 1.180 USD on the date of payment December 11th 2017.
[13] Further additional IDA (International Development Association) credit funding had been channeled through NISP amounting to USD 44.5 million in the same time.

levels. These challenges were addressed through NISP and the EPI network was continuously being strengthened with external sources of finance including Gavi's Health Systems Strengthening (HSS) program.

It is not possible to quantify the extent to which these challenges hampered the EPI program, but it is clear that it operated in a difficult environment. Although targets were not met, vaccination coverage rates improved in spite of the challenging context.

What might have happened in the absence of the German grant in 2016? There are two possibilities: either a large number of children would have gone unvaccinated, and a significant number would have died; or one of Gavi, NISP and/or the GoP would have found the funds to fill the gap. In either case, the true consequence would result from the absence of expenditure in another area, or for another purpose. This cannot easily be known, and the evidence is therefore inconclusive.

Quality of implementation

The effective implementation was ensured through the well-established financing mechanism used by Gavi with built in oversight mechanisms. The FC funds were transferred directly to an account used solely for procuring vaccines and medical consumables from UNICEF. A further strength of the FC project was that it used existing EPI systems. After vaccines were procured, they were supplied to established MoH immunization programs (for details see under Coherence).

The World Bank reported weaknesses in governance and accountability mechanisms and fragmentation between federal, provincial and district levels. However, mitigating measures were undertaken. The goals of the EPI program were closely monitored during this period by several mechanisms, which included the annual Joint Appraisals coordinated and facilitated by Gavi; the planning and reporting through the Comprehensive Multi Year Plans; the WUENIC reviews of immunization data; the oversight mechanisms built into the NISP; and since 2020 the TPVIC surveys arranged under the NISP. However, limited data concerning equity in the vaccination practice nor information on wastage etc. could be provided for this evaluation (also see Efficiency below). This is an indication for continuing challenges in monitoring and management of the actual implementation of the EPI in Pakistan.

Unintended effects

The EPE was not aware of any unintended effects.

Rating summary:

Neither of the two outcome indicators was met but there was significant improvement in vaccination coverage rates for both pentavalent and pneumococcal vaccines and pre-pandemic rates were quickly restored after the COVID-19 pandemic. The DHS 2017-18 and other more recent reports have reported continuing strong increases in the proportion of fully vaccinated children, and importantly there is no significant difference in vaccination coverage rates for boys and girls or for rural compared to urban areas although disparities by wealth quintile and region persist. It is plausible that the FC project contributed to the positive trend. The quality of implementation in terms of procurement and distribution to EPI was sound, but little is known of implementation within EPI. The effectiveness in summary is rated as moderately successful.

Effectiveness: 3

Efficiency

Production efficiency

Immunization of children under 5 is regularly identified as a highly cost-effective intervention. A comparison across countries reveals, that child health and immunization produce the most favorable average cross-effectiveness ratios (ACERs). Across the life course, interventions targeting the newborn have the lowest ACERs, closely followed by interventions targeting U-5s (Sternberg et al 2021). Another study assessed the return on investment for vaccinations to prevent diseases related to ten antigens in 94 low- and middle-income countries during 2011-20 the Decade of Vaccines (Sachiko Ozawa/WHO, 2016):

"We derived these estimates by using costs of vaccines, supply chains, and service delivery and their associated economic benefits. Based on the costs of illnesses averted, we estimated that projected immunizations will yield a net return about 16 times greater than costs over the decade (uncertainty range: 10-25). Using a full-income approach, which quantifies the value that people place on living longer and healthier lives, we found that net returns amounted to 44 times the costs (uncertainty range: 27-67). Across all antigens, net returns were greater than costs."

The mechanism chosen (Gavi/UNICEF/EPI) is known to be efficient. Gavi itself is an efficient organization with minimal in-country presence. Each year it publishes its operating expenses ratio which for 2021 was 6.35 % (Gavi Annual Financial Report, 2021). In the project under review, in-country overheads were absorbed by the Gavi program and/or MoH/EPI. Gavi is supported by a number of donors and through pooling and bundling the Gavi approach can lead to high efficiencies in the procurement of vaccines. However, the bilaterally provided annual tranche FC funds, earmarked for procurements, go along with comparatively high transaction costs for Gavi.

Use of existing systems is an undoubted strength of the project. However, by using GoP systems, the project took on board the challenges that those systems face. They included cold chain management; education and training; chronically understaffed health centers and frequent staff turnover; accessibility to remote regions and data collection and analysis. Where they are known to have affected the program directly, they are referred to in this evaluation but there is no easy way to assess nor quantify their overall impact. Gavi pays close attention to in-country results through organization of regular Joint Appraisals in all program countries, financial audits, and through its Grant Performance Framework (GPF) (Gavi, 2019 (b)). Still, no specific data and information on the efficiency of the in-country implementation was made available by Gavi during this evaluation.

UNICEF procures vaccines at highly competitive prices and operates its procurement service on a not-for-profit basis. UNICEF does charge handling fees. They are variable and for vaccines they currently stand at 4%[14]. No information was made available of whether the FC funds were used for the handling fees or not. All procurement is on a competitive basis and the low prices are understood to be achieved because of the very large volumes procured.

The evaluation considered whether alternative approaches are feasible, but it would be difficult and probably unwise to adopt an alternative approach. One alternative could have been channeling the FC funds through the NISP. However, this would have increased indirect costs compared to the implementation through Gavi/UNICEF/EPI directly.

The vaccines were necessarily obtained in a timely manner since the payments of the first two phases (this project is the first phase) were made retrospectively by reimbursement. The vaccines had therefore already been procured at the time of payment. A secondary question is whether the vaccines were used in immunization programs in a timely manner, but no information has been made available to verify this. It has not been possible to identify specific vaccines financed by the FC project, since the funds contributed to the broader EPI program. The funding was not allocated to identifiable and traceable batches of vaccines (this would neither be logistically possible nor desirable).

Wastage is a routine hazard of immunization programs and can occur from unopened vials or from open vials. Wastage from unopened vials can arise through inefficiencies in the supply chain, including temperature control, temperature monitoring, and stock management during storage and transportation. It may result from vaccine expiry, excess heat exposure, freezing, breakage, missing inventory or discard following outreach sessions etc. Wastage from open vials is often inevitable through discarded doses from vials or unused doses of multidose vials. Within the Pakistan EPI allowances for wastage are set at 10 % for pneumococcal vaccines and at 5 % for pentavalent (Altaf et al, 2021). However, no observations on actual levels of wastage can be made here since no information has been made available.

Allocation efficiency

This evaluation has indicated that alternative approaches to immunization were not viable. Pakistan could potentially procure vaccines independently, but this would raise prices and be less efficient, not more. Also, it would have less technical support without UNICEF or Gavi.

[14] https://www.unicef.org/supply/handling-fees

The positive effects could have been increased with the resources available, but through improved efficiency rather than through an alternative design which was not possible for the reason given. Numerous possibilities for improved efficiency have been cited by observers and stakeholders a.o. improvements of cold chains but also training and staffing. These hints raise questions concerning the adequacy of the FC earmarking.

Indications of deficits concerning equity in coverage rates in particular concerning different provinces further challenge whether a good allocation efficiency has been adopted in the implementation of the Pakistani EPI (also see under Effectiveness). ***Rating summary:***

Even though the FC project supported a functioning, well-established system, which reached high efficiency in vaccine procurement, little is known about the efficiency and wastage within the national EPI program. Studies report that the project outcome was affected by challenges faced in human resources and the cold chain which were steadily being remedied but did affect production as well as allocative efficiency. Equity in allocation could be enhanced. Overall, the Efficiency is rated as moderately successful.

Efficiency: 3

Impact

Overarching (intended) developmental changes

The **revised impact objective of the FC project was the improvement of the health of the population in Pakistan, in particular children under the age of 5** (also see Annex 2). The achievement of this objective is measured by a reduction in child mortality as summarized at Figure 8 below:

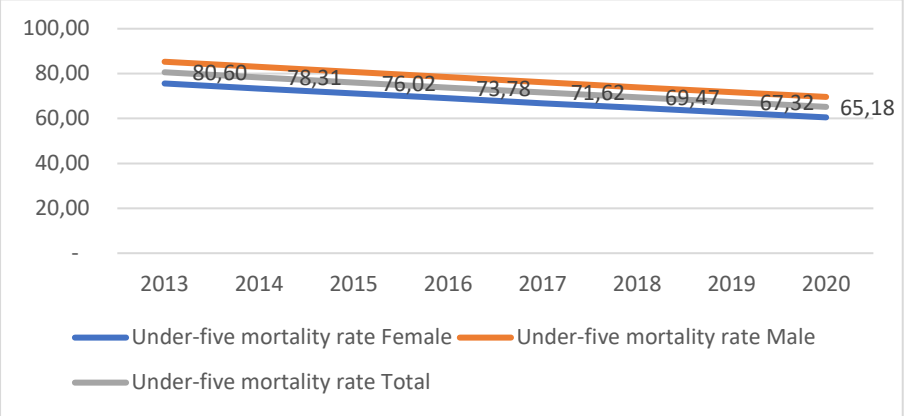
Figure 8: Project results at the level of the impact objective

Indicator	Status at project appraisal (2016)	Target value at project appraisal	Status at final report (2019)	Status at EPE (2022)
Reduction of U-5 Mortality Rates, - deaths per 1,000 live births	**76.02 deaths per 1,000 live births** (2015, IGME)	Aligned with SDGs to reach **25 deaths per 1,000 live births** by 2030	**69.47 deaths per 1,000 live births** (2018, IGME).	**65.18 deaths per 1,000 live births (**2020, UNICEF) As the target is for 2030 it cannot be assessed yet.

The target is a CMR of 25 deaths per 1,000 live births by 2030, aligned with the SDGs. The CMR for 2020 is 65.18 deaths per 1,000 live births (UNICEF). If the current annual rate of reduction (ARR) of 2.5 % were maintained, the 2030 CMR would be 50.6 deaths per 1,000 live births, more than double the SDG target.

Nonetheless, the figure below shows a clear downward trend for total CMR as well as separately for boys and girls. As is usual in many countries, the CMR for girls is lower than that for boys.

Figure 9: Pakistan under-5 mortality rates 2013 to 2020 per 1,000 live births, with gender disaggregation



Source: Inter-Agency Group on Mortality Estimates (IGME)

There is more than one source of data for child mortality, but the Inter-Agency Group on Mortality Estimates (IGME) data is a well-regarded standard which takes account of data from a variety of sources. Also, while child mortality data may sometimes rely on estimates or occasionally incomplete data, trends are considered reliable. This positive trend in a key indicator demonstrates clearly that the overarching developmental change of improved health is effective at the level of the beneficiaries.

This EPE is unable to assert the impact at the level of vulnerable groups.

Contribution to overarching (intended) developmental changes

The contribution of the project to the improvements in child health as measured by the CMR cannot be accurately determined or quantified in this EPE. Immunization is only one of several contributory causes of reduced U-5 mortality even though, vaccinations for newborns are known to be essential. Further the project under review financed only a part of the vaccines administered under the EPI in 2016 (also see under Effectiveness). Thus, we can say that although it cannot be quantified, it is plausible that the project has had a positive impact on child health in Pakistan by providing nearly 5 million vaccinations over a year.

Gavi is reliant on donors like the German Government. The EUR 600 million grant committed for the period 2016-2020, of which this FC project forms a part, was a significant contribution to its program.

Implicit in the design document is an understanding of health being of benefit to development and thus to political stability. Any contribution in this area is an additional dividend since the project was not intended to address the national policy environment. There was no expectation that the FC project would contribute to structural or institutional changes or to changes in organizations, systems or regulations and none have been observed.

The project could be replicated. However, a better option would be to fund Gavi's wider operation, which BMZ already does with multilateral funding. This option has lower transaction costs allows funds to be allocated along with contributions from other sources. Unfortunately, this was not an option for the project under review because of fixed budgetary allocations for the period in question to multilaterals including Gavi. This was the first phase of a multi-phase program, so it initiated further KfW projects including different vaccines.

Contribution to overarching (unintended) developmental changes

No unintended overarching developmental changes are apparent

Rating summary:

It is too soon to say whether the 2030 CMR target will be reached, but at current rates of reduction Pakistan is very unlikely to achieve it. However, from 2016 to 2018 the CMR fell from 76 deaths per 1,000 live births to 69 and it further reduced to 65 deaths per 1,000 live births by 2020. The contribution of the FC project is plausible but cannot be quantified. It was critically dependent on existing working arrangements between Gavi, UNICEF

and the EPI program and the commitment of the GoP. The evaluation did not find any unintended overarching developmental changes. The impact is rated as moderately successful.

Impact: 3

Sustainability

Capacities of persons concerned

There are two issues: the sustainability of the project outputs – vaccinations; and the sustainability of the immunization program. At an individual level, vaccines provide protection for life and are inherently sustainable. In addition, the project measure indirectly protects the entire population with a high vaccination coverage through a significantly reduced risk of infection (herd immunity).

Programmatically, we can expect the immunization interventions in Pakistan to be sustainable for several reasons. Not least because health in general and immunization in particular, are priorities for the international community and for the GoP (a.o. see Relevance and Effectiveness above). Moreover, immunization is the sole mandate of Gavi and a major mandate of UNICEF. Both are well-established, well-funded and influential organizations with their own inherent sustainability.

In addition to the above, Gavi promotes sustainability by placing all partner countries on graduation plans to ensure that their domestic financial contribution is steadily increased[15]. Figure 10 below shows that the proportion of routine immunisation costs borne by the GoP increased from 14.44 % in 2013 to 32.79 % in 2016 before falling back to 18.33 % in 2017. At the time of the design therefore, approximately one-third of the immunization budget was reported to be provided by the GOP and much of the remainder was funded through Gavi/NISP. The cMYP 2016 - 2020 had a financing requirement of approximately EUR 3 billion (USD 3,472 billion). With around 33% of the total vaccination budget in 2016, the Pakistan government made a considerable contribution in that year. However, it is understood that COVID-19 and inflation have more recently undermined efforts to tip the balance in favour of domestic spending to cover health costs.

Figure 10: total costs of routine immunisation 2013 - 2017 Pakistan, USD

	2013	2014	2015	2016	2017
Government expenditure	31,169,569	34,648,998	22,256,157	40,600,289	33,299,947
non-government expenditure	184,614,595	83,682,527	44,578,904	83,221,610	148,366,549
Total expenditure	215,784,164	118,331,525	66,835,061	123,821,899	181,666,496
Government as % of total	14.44	29.28	33.30	32.79	18.33

Source: Gavi Co-Financing Information Sheet 2022

Gavi Co-financing information has not been released to the EPE after 2017, however the NISP recently reported (NISP, 2022) on the percentage relative under or over contribution against the Gavi designated co-financing obligation. It is clear from the Figure 11 that the obligation has been exceeded in all years from 2015/16.

Figure 11: Government financing of vaccines over the years in PKR million

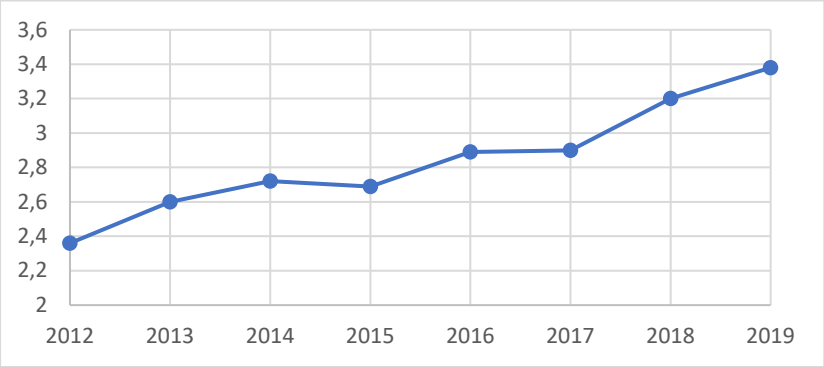
Financial year	Co-financing obligation	Investment made by the Government	Over/(under) contribution
2014-15	1,402	1,024	(26%)
2015-16	746	2,201	195%
2016-17	1,410	3,428	143%
2017-18	2,948	5,961	102%
2018-19	3,234	5,306	64%
2019-20	3,346	6,472	93%

Source: NISP 2022

[15] The Gavi co-financing requirement for Low Income Countries (LICs) is 0.20 USD per dose without any annual increase. When a country graduates to become a Phase 1 country, the co-financing requirement remains the same for the first year, but thereafter each dose of each co-financed vaccine is at an agreed “price fraction” which increases by 15 % each year. When a country moves into Phase 2, the co-financing requirement increases at a rate designed to reach 100 % over an agreed number of years (often five). LICs, Phase 1 and Phase 2 countries are determined by income thresholds which are updated regularly by Gavi (Gavi. Co-Financing Policy, 2015).

The sustainability of vaccine financing is dependent on levels of spending in health. Historically Pakistan's health system has been chronically under-funded, both in total and by governmental spending. Pakistan's current health expenditure has been increasing slightly every year and has gone from 16 USD per person in 2000 to 39 USD per person on a Purchasing Power Parity (PPP) basis (WHO 2019, World Bank website[16]). This is far below the 86 USD per capita spending estimated by WHO as required for essential health care services. The low government spending has led to a high although falling out-of-pocket payment. It stood at 54 % in 2019 (World Bank data). However, in recent years, health spending as a percentage of GDP has been climbing steadily as indicated at Figure 12, so that by 2019 it stood at 3.4 %.

Figure 12: Pakistan: health spending as a percentage of GDP



Source: World Bank website: https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS?locations=PK

Risks to the continuing program include the GoP not being able to finance its share of the EPI as required by the graduation plan. However, it has a good track record in this in recent years and Pakistan's economic growth prospects should enable it to continue. Against this a major source of finance has been the World Bank managed MDTF, the NISP, which comes to an end in 2022. Other risks include the on-going risks of human capacity, and in particular the frequent turnover of staff and unavailability of qualified human resources (NISP, 2022). Investment in recent years has resulted in a much-improved cold chain (NISP, 2022), and this is no longer cited amongst major risks.

The key risk that was not sufficiently enumerated at the appraisal stage was that of pandemics such as COVID-19 that skew funding and operational priorities. Pandemics are costly and disruptive both institutionally and in terms of human resources, and this was the case with COVID-19. However, Pakistan is cited as a good example by UNICEF for quickly returning to pre-pandemic coverage rates through catch-up immunization activities which yet again underlines the high priority for the EPI in the GoP (also see under Effectiveness).

Contribution to support for sustainable capacities

The FC funds contributed to the Gavi/UNICEF and EPI program, which went on to strengthen and expand into further phases and to provide additional vaccines in 2017-19. However, the primary contribution of the FC project, as indicated above, was to the immediate vaccination need, rather than to the sustainability of the EPI program. This will come from sustainable financing, and investments in human capacity and infrastructure, which the FC project was not designed to support.

Durability of effects over time

The immunization program is reported to be popular and has support from across the political spectrum.

Real GDP growth is projected at 4 % in Financial Year 2022 after two years of poor growth resulting from the pandemic. Assuming sustained policy and reform implementation, growth is expected to reach its medium-term potential of 5 % (IMF, 2022). These levels of growth should be sufficient to sustain and increase support for the health sector over time.

However, threats to the sustainability of the vaccine effort remain. Since 2020, COVID-19 has undermined funding streams and put pressure on the organisations that deliver vaccines. Further, Pakistan continues to be

[16] https://data.worldbank.org/indicator/SH.XPD.CHEX.PC.CD?locations=PK

subject to unrest and conflict due to regional and ethnic strains, rights abuses, and poverty exacerbated by climate change. However, Gavi/UNICEF is unlikely to have problems delivering support to EPI except in periods of extreme unrest.

The positive effects of the wider Gavi/UNICEF engagement, which this project partially enables, include health systems strengthening, long term technical support and many components of capacity building which can be demonstrated by reference to their Pakistan strategy documents.

Rating summary:

While the sustainability of the annual tranche of FC funding exclusively earmarked for the procurement of vaccines and consumables is limited, the individual benefit from the so supported vaccinations is for life and is inherently sustainable. The sustainability of the immunization program in Pakistan depends upon the national and international levels of commitment which are both considered positive. There is also good reason to be positive about the sustainability of domestic financing since Pakistan has steadily increased its financing of the EPI program. The major threats to the sustainability of the immunization program are the possible discontinuance of NISP in 2022, and the risk that human resources cannot be recruited or retained at appropriate levels. Overall, the sustainability is rated as successful.

Sustainability: 2

Overall rating: 3

Taking into account the high relevance and positive developments on the outcome and impact levels despite missed targets, and assuming the plausible project contribution in a coherent and sustainable way but also considering deficits in equity and efficiency, the FC project is rated as moderately successful.

Contributions to Agenda 2030

The primary contribution to the 2030 agenda has been to support the reduction of the Child Mortality Rate in Pakistan. At current rates of reduction this rate is estimated to fall to 50.6 deaths per 1,000 live births by 2030, significantly short of the SDG goal of 25 deaths per 1,000 live births but a major improvement over the 76 deaths per 1,000 live births in 2015.

Project specific strengths/weaknesses and general conclusions/lessons learned

Strengths and weaknesses

Strengths:

- High levels of relevance to the needs in Pakistan
- Immunization is a highly effective and efficient health measure
- The project benefitted from well-established and trusted systems to deliver vaccines – Gavi/UNICEF/EPI
- Maximized cost efficiency through use of UNICEF vaccine procurement

Weaknesses:

- The project design did not include an explicit ex-ante theory of change, an ex-ante contribution analysis, and ex-ante political economy assessment, or an ex-ante assessment of value added.
- Equity monitoring and management: project objectives and indicators did not include equity (regional, poverty or gender)
- Project indicator only set for 2030 – interim targets were required

The internal Final Inspection made the following recommendations and observations

1. There is a need to strengthen health systems, including routine vaccination, over the long term. To this end, Pakistan must make a greater commitment to financing the health system through public spending. Health coverage around 5 % of GDP should be aimed for.

   Note: this has happened, and information presented in this EPE shows that health spending as a percentage of GDP has risen to 3.4 % in 2019.

2. The recommendations of the 2018 Joint Annual Review can be taken up; this requires above all improved financial management and procurement for vaccines, adequate and rapid filling of leading personnel positions, improved strategic planning in the vaccination system with the removal of existing bureaucratic hurdles and a stronger program overview, monitoring and evaluation.

   Note: a lot remains to be done if vaccination coverage in Pakistan is to reach the levels of other countries in the region, and the recommendation continues to be valid. Nonetheless, these issues have been a major thrust of the NISP in recent years, and some of the achievements are documented in this evaluation.

3. In order to achieve a better dovetailing and achievement of synergistic effects between multilateral and bilateral German contributions to Gavi in Pakistan, a plannable and longer-term commitment, especially of FC funds, is required.

Conclusions and lessons learnt

For outcome and impacts of projects supporting immunization programs, equity concerning coverage is essential. Therefore, outcome and impact objectives as well as indicators to measure the respective results should disaggregate by gender and other relevant criteria in the respective context (e.g. region, poverty, ethnicity) as a basis for enhanced equity monitoring and management by Gavi and GoP/EPI.

Future finance is likely to be more efficient if provided unearmarked and multilaterally to Gavi rather than in separate, annual, bilateral projects.

Rating methodology

Projects are rated on a six-point scale for each of the OECD DAC criteria. The scale is as follows:

Level 1 very successful: result is clearly above expectations

Level 2 successful: result meets expectations fully, no significant shortcomings

Level 3 moderately successful: result falls short of expectations, but the positive results dominate

Level 4 moderately unsuccessful: significantly below expectations, with negative results dominating despite discernible positive results

Level 5 unsuccessful: despite some positive partial results, the negative results clearly dominate

Level 6 highly unsuccessful: situation has deteriorated

The overall rating on the six-point-scale is compiled by weighting all six individual criteria as appropriate to the project in question. Rating levels 1-3 of the overall rating denote a "successful" project while rating levels 4-6 denote an "unsuccessful" project. It should be noted that a project can generally be considered developmentally “successful” only if the achievement of the project objective (“Effectiveness”), the impact on the overall objective (“Overarching developmental impact”) and the Sustainability are rated at least “satisfactory” (level 3).

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Annexes

Annex 1 - Abbreviations

ACER	Average cross-effectiveness ratio
ARR	Annual Rate of Reduction
CMR	Child Mortality Rate
cMYP	Comprehensive Multi-Year Plan
CPI	Corruption Perception Index
DC	German Development Cooperation
DHS	Demographic and Health Survey
EPE	Ex Post Evaluation
FATA	Ferderally Administered Tribal Areas
FC	German Financial Cooperation
EPI	Expanded Programme on Immunisation
FR	KfW final report
Gavi	Global Vaccine Alliance
GoP	Government of Pakistan
GPF	Grant Performance Framework
Hib	Haemophilus influenza type b
HSS	Health System Strengthening
ICC	Interagency coordination committee
IGME	Inter-Agency Group on Mortality Estimates
JAR	Joint Annual Review
KP	Khyber Pakhtunkhwa
LIC	Low Income Country
MCV	Measles vaccine
MNHSR&C	Ministry of National Helath Services, Regulations and Coordination
MDTF	Multi Donor Trust Fund
MoH	Ministry of Health, Pakistan
NISP	National Immunisation Support Program (World Bank managed Multi Donor Trust Fund)
PA	KfW project appraisal
Pentavalent	5 in 1 vaccination including diphteria, tetanus, whooping cough, hepatitis B, haemophilus influenza type b (Hib)
PPP	Purchasing power parity
PCV1	Pneumococcal vaccine
SDG	Sustainable Development Goal
TOC	Theory of Change
TPVICS	Third Party Verification Immunization Coverage Surveys
U-5	Under 5 year old children
UNICEF	United Nations Children Fund
VCR	Vaccine coverage rate
WHO	World Health Organization
WUENIC	WHO/UNICEF Estimates of National Immunization Coverage

Annex 2 – Target system

Project objective at outcome level		Rating of appropriateness (former and current view)			
At project appraisal: Decrease of child mortality and disease burden by reduction of vaccine preventable infections through nationwide vaccine coverage of all newborns with newly introduced vaccines (pentavalent vaccine, pneumococcal and rotavirus vaccine).		The outcome objective as defined in the project appraisal includes objectives relevant on the outcome as well as on the impact level. The outcome objective therefore is revised to clearly reflect the two different levels of project results as follows:			
During EPE (if target modified): Reduction of vaccine preventable infections through contributing to the nationwide vaccine coverage of all newborns according to the vaccination calendar with pentavalent and pneumococcal vaccines and under 5-year-old children not vaccinated accordingly.					
Indicator	**Rating of appropriateness** (for example, regarding impact level, accuracy of fit, target level, smart criteria)	**Target level at project appraisal**	**Status at project appraisal (2016)**	**Status at final inspection (2019)**	**Status at ex post evaluation (2022)**
1. Vaccination coverage rates for Pentavalent	Vaccine coverage rates are a widely used and appropriate measure of effectiveness. However, as equity in vaccination coverage is crucial for resulting in reduced disease burden, the indicators should incorporate data disaggregation by gender, region, poverty etc. to constitute an adequate basis for equity monitoring and results-based management. WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) is an appropriate data source.	**85 % in 2018**	73 % (2015, cMYP)[1] **73 %** (2015, WUENIC)	75% (2018, cMYP)[2] **80 %** (2018, WUENIC)	**83 %** (2021, WUENIC)
2. Vaccination coverage rate for Pneumococcal		**83 % in 2018**	73 % (2015, cMYP) **72 %** (2015, WUENIC)	79% (2018, cMYP) **81 %** (2018, WUENIC)	**83 %** (2021, WUENIC)

[1] The FC project appraisal referred to cMYP data for 2015, which only slightly differed from WUENIC applied in the EPE.
[2] The FC final report referred to cMYP data for 2018, for comparability the EPE refers to WUENIC data for reporting different status at appraisal, final report and EPE.

Project objective at outcome level		Rating of appropriateness (former and current view)			
2. No of beneficiaries of vaccination with: • **Pentavalent,** • **Pneumococcal**	Number of beneficiaries is an appropriate measure of outputs not outcomes. Therefore this indicator is not used for the evaluation.	--	--	--	--

Project objective at impact level		Rating of appropriateness (former and current view)			
At project appraisal: Improvement of the health of the population in Pakistan, considering populations at risk in particular		The impact objective as defined in the project appraisal does not further define "population at risk" and does not reflect the actual target group of the FC financed activities. The impact objective therefore is revised as follows:			
During EPE (if target modified): Improvement of the health of the population in Pakistan in particular children under the age of 5.					
Indicator	**Rating of appropriateness** (for example, regarding impact level, accuracy of fit, target level, smart criteria)	**Target level at project appraisal**	**Status at project appraisal (2016)**	**Status at final inspection (2019)**	**Status at ex post evaluation (2022)**
Reduction of mortality rate of under 5 year old children, deaths per 1,000 live births (CMR)	The children's mortality rate is widely used and an appropriate indicator to measure impact on children's health. The target was aligned with SDGs to be achieved until 2030. Although 2030 is still 8 years away there is value to look at current trends in CMR and this is done in the evaluation. The IMGE is an appropriate data source, however the baseline value cited in the project appraisal is incorrect and therefore revised in the evaluation.	**25 deaths per 1,000 live births by 2030**	**76.02** deaths per 1,000 live births (2015, IGME[3])	**69.47** deaths per 1,000 live births (2018, IGME)	**65.18** deaths per 1,000 live births (2020, UNICEF) Whether the target will be reached cannot be assessed yet as it is for 2030. At current rates of reduction, however, Pakistan will miss the target by far.

[3] Inter-Agency Group on Mortality Estimates

Annex 3 - Risk analysis

Key Risks identified at design stage	Relevant OECD-DAC criterion affected
Financial sustainability	Sustainability The risk was always mitigated by two factors: the Gavi graduation program that requires countries to increase their contribution over time; and the intent of the donor community to maintain financing of immunization in low-income countries including Pakistan. Domestic financing has been adequate, and Pakistan has exceeded the Gavi designated co-financing obligation in all years from 2015/16. Pakistan expects moderate economic growth in the immediate future. The risk has not yet materialized.
Personnel capacity	Effectiveness, Efficiency, Impact and Sustainability The NISP included several sub-components to support recruitment of qualified personnel to the EPI, and for oversight and supervision to be strengthened. By 2022 100% of Union Councils in three major provinces had at least two staff capable of providing immunization. However, despite improvements, frequent turnover of staff and unavailability of qualified staff continues to present significant challenges for the EPI. Senior technical positions remain unfilled in all provinces (World Bank, 2022).
Transportation - and delayed delivery of vaccines caused by inadequate transport	Effectiveness, Efficiency, Impact The NISP allocated US $34 million to the strengthening of the cold chain from 2016 to 2020 (World Bank, 2016). An internal KfW review noted the successful implementation of the Cold Chain Equipment Optimization Platform. This was carried out with other cold chain and transport reforms under the NISP. A review of the NISP noted that the percentage of districts in each province with functional cold chain equipment in place as per specifications in each tier of health system was above 90% in all provinces.
Supply and cold chain	Effectiveness, Efficiency, Impact See above
Outbreak of pandemic	Sustainability There were no outbreaks of pandemics in the FC project period, but the COVID-19 pandemic that broke out in 2020 is understood to have adversely affected the sustainability of the EPI program.

Annex 4 - Rating of the OECD/DAC criteria and sub-dimensions

Criteria and sub-dimensions		Rating
Relevance: Is the intervention doing the right things?		**2**
	Alignment with policies and priorities	2
	Alignment with needs and capacities of persons concerned	2
	Suitability of project concept	2
	Reaction to changes/adaptability	2
Coherence: How well does the intervention fit?		**2**
	Internal coherence	2
	External coherence	2
Effectiveness: Is the intervention achieving its objectives?		**3**
	Achievement of (intended) goals	3
	Contribution to goal achievement	2
	Quality of implementation	2
	Unintended effects (positive or negative)	2
Efficiency: How well are resources being used?		**3**
	Production efficiency	2
	Allocation efficiency	3
Impact: What difference does the intervention make?		**3**
	Overarching (intended) developmental changes	3
	Contribution to overarching (intended) developmental changes	2
	Contribution to overarching (unintended) developmental changes	2
Sustainability: Will the benefits last?		**2**
	Capacities of persons concerned	2
	Contribution to support for sustainable capacities	3
	Durability of effects over time	2

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