

Ex-post evaluation

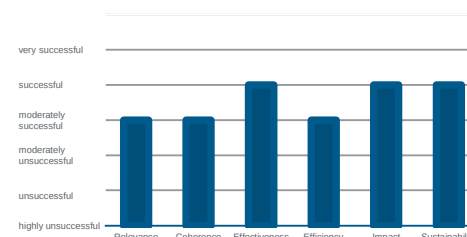
Cardiology Centre, Uzbekistan

Title	Cardiology Centre		
Sector and CRS code	Medical services / 1219100		
Project number	2009 67 018		
Commissioned by	Federal Ministry for Economic Cooperation and Development (BMZ)		
Recipient/Implementing agency	Republic of Uzbekistan, represented by the Ministry of Foreign Affairs, Investment and Trade / Uzbek Ministry of Health (MoH)		
Project volume/financing instrument	EUR 3.0 million, loan		
Project duration	December 2011 – August 2020		
Year of report	2024	Year of random sample	2022

Objectives and project outline

The objective at outcome level was to improve the rapid diagnosis and targeted treatment of cardiovascular diseases at the Cardiology Centre in Tashkent. For this purpose, the Centre was additionally equipped with modern medical equipment. The objective at impact level of the project was to improve the health status of the Uzbek population.

Overall rating:
successful



Key findings

The project contributed to important qualitative progress in the ability to treat cardiovascular diseases with modern technologies both in the Center and in the country and thus had a developmental impact. The overall rating is successful.

- Reducing premature mortality from cardiovascular disease in the population through appropriate medical care remains of great relevance.
- The project occupied a special position in the DC landscape, whereby stronger interlinking with TC would have certainly led to positive synergies.
- The FC funds contributed, albeit with a delay in implementation, to the rapid further development and improvement of diagnostic procedures as well as to major progress in the therapeutic area, since the country previously had virtually no possibilities for the interventional treatment of heart and vascular diseases. The transfer of knowledge has had a far-reaching impact on the downstream reference system, helping to spread modernization throughout the country.
- The high level of professionalism, good management and commitment of the Centre, which was also reflected in the maintenance, servicing and user care of the medical equipment, contributed significantly to the project's success.
- Since vulnerable groups were only entitled to reimbursement for conservative treatment methods until 2021, they were only able to benefit partially from the FC-financed equipment - contrary to what was planned in the project design.

Conclusions

- In order to avoid disparities in the ability to use advanced treatment methods, it is important to strengthen financial protection mechanisms as technologies expand.
- In terms of a holistic approach, preventive measures and rehabilitation options must be considered in addition to diagnosis and treatment of patients.
- A partner's high level of leadership, commitment and ownership is an important factor in the quality and organization of the services provided.

Ex- post evaluation – Rating according to OECD-DAC criteria

Overview of sub-ratings:

Relevance	3
Coherence	3
Effectiveness	2
Efficiency	3
Impact	2
Sustainability	2
Overall rating:	2

Overall context and classification of the project

Sectoral developments: Health policy and reforms

Uzbekistan is a Central Asian country that became independent in 1991 with the disintegration of the Soviet Union. The health system with a highly centralised administrative structure is based on the Semashko model¹ of the former Soviet Union, with the Ministry of Health (MoH) at the forefront of the system – as **service** provider, administrator and financier. The system consists of three different hierarchical levels: the Republican level (national), the viloyat or oblast level (regional) and the last level, which includes districts (tuman or rayon) and cities. Since achieving independence, the health system has been decentralised to some extent – the MoH further delegated administrative responsibilities to the oblast and regional administrations, but until now retained control over the implementation of centrally developed standards and guidelines.

The right of the population to health and health care is enshrined in the Uzbek constitution. Basic medical care is supplemented by a law from 1996, which sets out the legal framework for the healthcare system and defines the rights and entitlements of patients.² Known as the “Basic Benefit Package”, introduced in 1996, it includes basic care,³ emergency care, care for “socially significant and dangerous” diseases (in particular the most important communicable diseases and some non-communicable diseases such as mental illness and cancer) and specialised (secondary and tertiary) care for populations classified as vulnerable by the government. Medications for inpatient care that are part of the basic service package are supplied. Outpatient drugs are not covered except for vulnerable populations⁴.

The reforms in the health sector introduced since the mid-1990s reflect the Uzbek government's commitment to improving the quality of life and health care of the population. The first important policy document on health reform in 1998 focused on primary and emergency care systems.⁵ In the following years, reform initiatives were extended to secondary and tertiary care, academic training and medical science. The 2003 Presidential Decree initiated a pilot project to reform tertiary care research facilities and to create specialised centres and clinics with modern diagnostic and treatment technologies.⁶ Two decrees from 2007 also set out the strategic direction for

¹ The Semashko system was named after Nikolai Aleksandrovich Semashko, who was the first Minister of Health and one of the organisers of the health system in the former Soviet Union.

² Republic of Uzbekistan (1996): Law on Health Protection, 29 August 1996. No. 265-I. Tashkent.

³ This is offered by public primary care facilities and outpatient clinics of public secondary and tertiary facilities (as well as private outpatient clinics).

⁴ These include Second World War veterans, HIV/AIDS patients, patients with diabetes or cancer, and single pensioners registered by support agencies. See Ahmedov et al. (2014): Uzbekistan: Health system review.

⁵ Republic of Uzbekistan (1998): On the State Program for Reforming the Public Health System of the Republic of Uzbekistan. Decree of the President of the Republic of Uzbekistan. №UP-2107

⁶ Republic of Uzbekistan (2003): About measures for further reforming of health care system. Decree of the President of the Republic of Uzbekistan. №UP-3214

the health sector until 2020, with the main objectives being to ensure high-quality maternal and infant health, the well-being of the population and the availability of high-quality health care.⁷

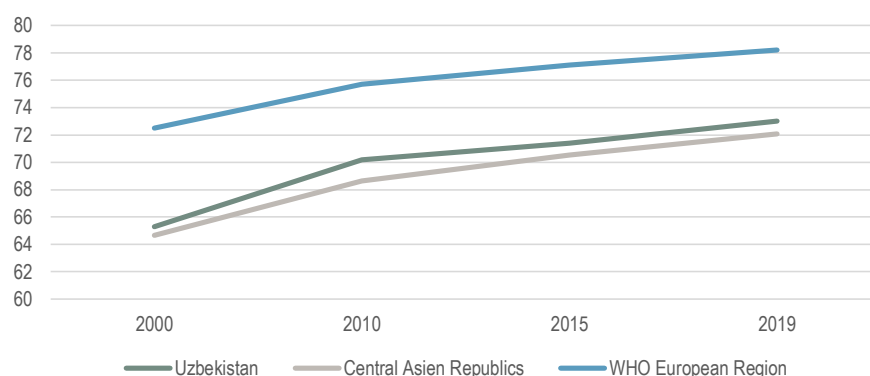
In 2018, Uzbekistan initiated further comprehensive and far-reaching reforms of the health system, including fundamental changes in health finance and service delivery systems, focusing on primary health care (PHC).⁸ Three pillars of reform define the respective focus areas: (1) PHC transformation, (2) implementation of health finance reforms, and (3) development and improvement of the e-health system. (1) includes the introduction of a new system of preventive medical procedures, which includes segmentation of the population into NCD risk groups with proactive follow-up for high-risk groups and targeted screening and early diagnosis for certain diseases. While no social health insurance system existed at the time of the project appraisal (PA) and voluntary health insurance contributions accounted for only 2.7% of total health expenditure (in 2010), a significant innovation is the establishment of a state health insurance organisation, the State Health Insurance Fund (SHIF), proposed under (2). It was introduced in November 2020⁹ to purchase healthcare services defined in a new State-Guaranteed Benefit Package (SGBP¹⁰). A pilot project took place in the Syrdarya area in 2021 with the plan to gradually expand the new system to other regions. Finally, under (3), as part of the development and improvement of the e-health system, an electronic platform for the follow-up of health indicators, electronic health records and a system for issuing electronic prescriptions and referrals in accordance with the SGBP are to be established.

The private sector currently accounts for a small but growing share of health care services. Almost three quarters of hospital beds are still in public hospitals: In 2018, the healthcare sector comprised 153,600 beds, of which 117,366 were public beds. Private hospitals are usually very small, with an average number of 28.2 beds.¹¹

Development of the health situation

Over the last two decades, Uzbekistan has made significant progress in improving general health indicators. Life expectancy at birth increased from 65.3 years in 2000 to 73 years in 2019. The figure for 2019 is favourable compared to the average of Central Asian countries (72 years). Nevertheless, it is well below the WHO European region average (78.2), see Figure 1.

Figure 1: Life expectancy at birth (years)



Source: WHO the Global Health Observatory; own presentation.

Significant improvements were also seen in the maternal mortality rate and the mortality rate of children under the age of five and infants. Between 2000 and 2020, the maternal mortality rate fell from 42.6 to 30.2 per 100,000

⁷ Republic of Uzbekistan (2007): On the main directions of further deepening of reforms and implementation of the State Program for Health Development. Decree of the President of the Republic of Uzbekistan. №PP-3923; and Presidential Edict No. 700, a follow-up document to: Presidential Decree No. 3923.

⁸ The Strategy Paper "Concept for the Development of Health Care in the Republic of Uzbekistan 2019–2025", approved by Presidential Decree 5590 (7 December 2018), laid the foundation for the planned reforms.

⁹ See Presidential Resolution 4890.

¹⁰ The scope of the pilot project's output was expanded: 11 outpatient NCD drugs were included in the benefit package and made available to patients through the new reimbursement mechanism.

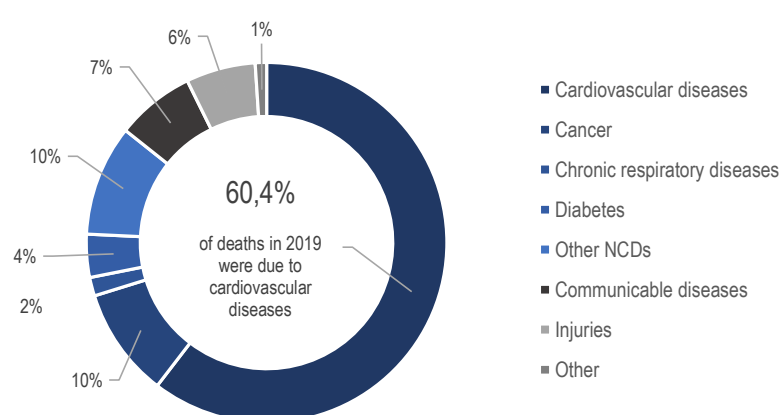
¹¹ World Bank (2022): Uzbekistan public expenditure review.

live births, the mortality rate for children under the age of five from 60.5 to 14.73 per 1,000 live births, and the infant mortality rate from 50.7 to 13.2 per 1,000 births.

Despite these positive developments, the burden of non-communicable diseases (NCD) is high in Uzbekistan as well as globally – this mainly includes cardiovascular diseases (cardiovascular diseases, CVD), cancer, diabetes and chronic respiratory diseases. CVDs are the leading cause of death and, according to WHO estimates, caused 32% of all deaths worldwide in 2019 – i.e. 17.9 million people died from cardiovascular diseases alone. In comparison, 2.3 million people worldwide died of HIV/AIDS, malaria and tuberculosis combined.

At the time of the PA in 2010, CVD was responsible for 61.1% of all deaths in Uzbekistan. While Uzbekistan lagged behind Tajikistan, Mongolia and Azerbaijan with a mortality rate of 529.8 per 100,000 inhabitants (age-standardised¹²), mortality rates of over 600 per 100,000 inhabitants were estimated to be twice as high as in Europe. CVD still dominates the disease burden in Uzbekistan.

Figure 2: Distribution of causes of death in Uzbekistan in 2019



Source: WHO Mortality Database; own presentation.

Figure 2 shows the distribution of causes of death in 2019 (i.e. last estimate by WHO), of which a total of 86% of deaths were due to NCD. The proportion of deaths due to CVD was still high at 60.4% – almost twice as high as the proportion of deaths due to CVD on a global level. The age-standardised death rate fell slightly to 441.9 per 100,000 inhabitants.

Diagnosis and treatment of CVD

Early diagnosis and treatment of cardiovascular disease can reduce disease burden and mortality. Treatment in Uzbekistan mainly takes place at regional and national level in the capital, i.e. it also dominates hospital-based, specialised care at the expense of currently underdeveloped primary care.

The “Republican Specialised Scientific and Practical Medical Center of Cardiology” (RSSPMCC; hereinafter also referred to as “Cardiology Centre”) in Tashkent was established in 2003 as part of the creation of specialised centres described above and is at the top of the care pyramid for the treatment of cardiovascular diseases. It performs the reference function and receives referrals for cardiological cases from the regions. Although the centre is at the forefront of care and supported by the government as part of the reform efforts, at the time of the PA there was a lack of modern medical equipment to properly perform the centre’s reference function. Concrete bottlenecks included the surgical and minimally invasive treatment of life-threatening cardiovascular diseases such as cardiac arrhythmias or vascular constrictions, as only outdated Russian-produced equipment was available for

¹² Age-standardised mortality rates are used to compare the mortality rates of countries without this being influenced by the different age distributions in the individual countries.

this treatment. There was also a lack of a CT scanner and a modern system for resuscitation. Obsolete laboratory and ultrasound equipment also had to be replaced and additional diagnostic equipment obtained.

Project summary

By providing the Cardiology Centre with additional modern medical equipment, the aim was to improve the quality of the diagnosis and treatment of cardiovascular diseases and thus contribute to improving the health of the Uzbek population. The programme's target group was the entire population of Uzbekistan.

The FC project was initiated in accordance with the Decree of the President of the Republic of Uzbekistan No. PP-1655 of 2 December 2011 and the agreement on financial cooperation between the Government of Uzbekistan and the Government of the Federal Republic of Germany of 27 December 2010. Under this arrangement, German FC provided a loan of EUR 3.0 million for the implementation of the project.

Total costs

As part of its own efforts, the Uzbek government has carried out extensive renovation measures at the Cardiology Centre in accordance with the agreement. The original estimate of EUR 0.3 million was significantly exceeded.

In EUR million	Investment (planned)	Investment (actual)	Complementary measure (planned)	Complementary measure (actual)
Investment costs (total)	3.3	7.02	/	/
Counterpart contribution	0.3	4.05*	/	/
Debt financing	3.0	2.97	/	/
<i>of which BMZ budget funds</i>	<i>3.0</i>	<i>2.97</i>	<i>/</i>	<i>/</i>

* See Project Completion Report, July 2021.

Note: The German Federal Ministry for Economic Cooperation and Development (BMZ) budget funds actually disbursed shown here differ slightly from those in the project completion report, as the equipment delivery was not yet entirely completed at the time of the final inspection.

Map of the project country incl. project location



Source: own presentation (KfW Development Bank based on Openstreetmap.org, Global Administrative Database (GADM) V.4.1)

Rating according to OECD-DAC criteria

Relevance

1. Alignment with policies and priorities

Adequate medical care for the population through the use of modern, internationally standardised equipment was and is still a goal of the Uzbek government. At the time of the PA, the project was in line with the government's reform efforts, as set out in Presidential Decree 3214 of 2003, to equip specialised clinics with high-tech diagnostic and medical equipment in order to be able to carry out sophisticated treatment and diagnostic methods.

Following Uzbekistan's commitment to implement the 2030 Agenda for Sustainable Development in 2015, the government's current stated goal is to reduce premature mortality in the population due to cardiovascular, oncological, diabetes and chronic respiratory diseases by 30% by 2030. In 2018, 16 national targets and 125 corresponding objectives were adopted.¹³

The increasing significance of chronic, non-communicable diseases (cardiovascular, cancer and metabolic diseases) was recognised and addressed in the Federal Ministry for Economic Cooperation and Development (BMZ) sector concept "Health in German development policy" (2009). The FC commitment is currently based on the country strategy for bilateral cooperation with the Republic of Uzbekistan dated July 2017. The focus is on health and sustainable economic development, with the commitment in the two sectors evolving from the priorities of the Uzbek government at the beginning of the cooperation. At the same time, it supports the development policy priorities of the German Federal Government by addressing the core topic of "health" in the BMZ 2030 Strategy.

¹³ <https://nsdg.stat.uz/en/>

2. Alignment with needs and capacities of persons concerned

The project's target group was the entire Uzbek population. Given that cardiovascular disease is the leading cause of death in Uzbekistan, the targeted improvement in diagnostic and treatment options addressed a priority need of the target group to manage the burden of disease.

Equipping the Tashkent Cardiology Centre (RSSPMCC) with state-of-the-art medical equipment was intended to help the centre perform its reference function properly. The Cardiology Centre was solely responsible for proposing and defining the procurement list for medical equipment. In this respect, it can be assumed that it was aligned with the needs of the centre for better diagnosis and treatment of CVD. However, the core problem of inadequate equipment with modern medical devices not only applied to the top reference level, but also to all levels of care in the country. In this respect, it is questionable whether strengthening primary and secondary health care should not have been a priority with a view to providing care for the entire Uzbek population as a target group. In addition, the measures targeted people who were already ill, i.e. diagnosis and treatment in the acute situation. However, prevention measures are essential for the early prevention and long-term reduction of the burden of disease and also have great potential to reduce direct costs, i.e. those of cost-intensive treatment as well as indirect costs due to economic productivity losses. It can be noted that a financing volume of EUR 3 million was not intended for such wide-ranging measures and would probably not have had a significant impact as an individual measure.

According to the PA, the intent was to take disadvantaged or vulnerable parts of the target group into account directly in the design: "Since cardiovascular diseases affect all levels of society in Uzbekistan and around 20% of patients are classified as socially vulnerable and treated at no additional out-of-pocket cost at the Cardiology Centre in Tashkent, impoverished people will also benefit from the improvements financed by FC." However, until 2021, the benefit package only covered conservative treatment methods through medication, i.e. access to modern therapeutic technologies as part of the FC-financed equipment was reserved for self-pay patients. This means that at the time of the PA, the applicable legal framework conditions were ignored to the extent that vulnerable groups only had financially reimbursed access to certain treatment methods and could thus only partially benefit from the FC-financed equipment from the outset. Without financial coverage, those affected suffer particularly from cardiovascular diseases, which require long-term medical treatment and whose precise diagnosis and treatment are extremely costly and can lead to catastrophic expenses. As this group of diseases occurs at an earlier age in Uzbekistan than elsewhere due to health risk factors such as tobacco and alcohol consumption, unhealthy diet and lack of exercise, the disease also affects a part of the working population, so people from this group can be lost as income providers in families in the long term. A significant innovation only emerged with the introduction of the financing system via the SHIF (for Tashkent from 2021), which now grants vulnerable population groups financially covered entitlement to the entire spectrum of treatment options.

The project received the poverty relevance "MSA" (indirect alleviation of poverty at macro or sectoral level, corresponding to: AO1) during the appraisal. It is questionable how the above-mentioned wording should be understood with regard to addressing impoverished people in this context. If it means that impoverished people benefit because they are treated without additional payments, this would have a *direct* poverty-alleviating effect – and the SUA identifier, which describes immediate poverty reduction, would have been appropriate. However, if predominantly indirect effects were intended, the MSA identifier (non-delimitable and indirectly reachable target group – via a longer impact chain) would be appropriate. However, this more complex theory of change assumes that impoverished people suffering from cardiovascular diseases will benefit from the overall investment in the longer term through the set-up of mechanisms to hedge the financial burden in the event of the disease. However, it is questionable to what extent this development was foreseeable during the appraisal.

3. Suitability of project concept

The concept and the underlying theory of change, according to which the improvement of the rapid diagnosis and targeted treatment of cardiovascular diseases at the Cardiology Centre (outcome) contributes to improving the health status of the Uzbek population (impact), seems fundamentally understandable. For example, by supplementing the RSSPMCC with modern medical equipment, the under-supply and the often poor condition of equipment should be taken into account in order to achieve an improved, needs-based offer at output level. This should enable the centre to properly perform its reference function and develop competences in the treatment of cardiovascular diseases in accordance with international standards. As the centre has an important educational, knowledge transfer and referral function for the lower levels of care, a broadcasting and multiplier effect from centre support was expected in the PA. In this respect, it seems plausible that improved diagnosis and treatment and the expansion of knowledge in the field of modern cardiological care contribute to an improvement in the health

status of the population. Overall, the impact logic requires that, in addition to functional infrastructure and equipment, sufficiently qualified personnel and medicines are available, facilities are managed effectively and efficiently, and equal access is guaranteed for all parts of the population.

From a technical and organisational point of view, the Cardiology Centre, which reports directly to the MoH, was intended as the programme executing agency, while a consulting firm was to assist in the preparation of the tender documents, the implementation of the various tenders and monitoring the supply contracts. In ex-post terms, the division of responsibilities appears appropriate. The financial framework allowed for selective funding of the Cardiology Centre and seems appropriate for this purpose.

Two indicators were formulated at PA to measure the achievement of objectives at outcome level: (1) increase in the number of patients treated and (2) reduction in the duration of treatment through improved diagnosis and thus targeted treatment. The first indicator only targets the quantity, but not the quality of diagnosis and treatment. The development of high-tech cardiological treatment is therefore presented as part of the evaluation using a number of additional indicators in the areas of endovascular¹⁴ therapy, the treatment of cardiac arrhythmias and cardiac surgery. The bed occupancy rate is also used to measure the inpatient capacity utilisation.

Overall, the measure was designed with a holistic approach to sustainable development. The supplementary equipment of the Cardiology Centre contributed to improving treatment and thus reducing mortality as a result of these diseases. Faster recovery of treated patients promotes resumption of income-generating activities. Care activities in the family are reduced, i.e. relatives who were entrusted with care can devote themselves to other activities. The project thus contributes to economic and socio-economic benefits.

Overall, the project design appears to be suitable for contributing to the objective of the DC programme “Health in Central Asia”, which aimed to improve the health status of the population.**4. Reaction to changes/adaptability**

The insolvency of the consulting firm led to its task being taken over by the local subcontractor starting in 2015.

Rating summary

Strengthening the fight against cardiovascular disease remains a major issue in Uzbekistan. The question remains whether, at the time of the PA, the strengthening of specialised treatment options should have been given the highest priority or whether the improvement of prevention options and quality of care at primary and secondary levels should have been a priority first. However, as already discussed, the financial framework was not designed for such broad measures.

On the other hand, it is more critical that the actual legal framework conditions were not taken into account in the appraisal to the extent that vulnerable groups could only benefit from part of the FC measure without additional payment.

Relevance: 3

Coherence

5. Internal coherence

The project was part of the DC programme “Health in Central Asia”, whereby the focus in the Uzbek health system was largely on the areas of mother and child health, the fight against tuberculosis and the modernisation of oblast hospitals. The FC commitment being evaluated, on the other hand, addresses cardiovascular diseases as the main cause of death and was launched at the express request of the President of Uzbekistan at the time. In this respect, the project occupies a special position within the measures of German DC.

At the time of implementation, TC supported the qualification of doctors and healthcare personnel in modern medical technology on a bilateral level (2013–2018; and on an ongoing basis in 2019–2024). This includes not only the application, but also the qualification to be able to perform preventive technical maintenance.

¹⁴ Endovascular treatments are performed through the inside of blood vessels. Access to the vascular system is usually gained by puncturing the large artery in the groin.

The measure focused on capacity building in the medical intervention fields of “minimally invasive surgery” and “imaging procedures”, which focused on selected hospitals in the field of emergency medicine and paediatrics, i.e. the Cardiology Centre was not part of the target group. It seems obvious that a combination of TC and FC could have had positive effects on the use and maintenance of the equipment supplied under the project being evaluated.

Since 2015, the TC project has also supported the introduction of a digital inventory and maintenance system for high-tech devices based on the open source information system for medical devices (openMedis). However, the MoH switched to a different system at the end of 2021. A nationwide, digital inventory and maintenance system is currently being designed.

Content-related touchpoints with other FC measures are currently as follows:

- The FC project “Support to Digital Reform in the Health Sector” (BMZ No. 2019 68 544, 2019 79 193) aims to improve the quality and efficiency of healthcare services by introducing digital applications in health management, administration and clinical processes. Administration of and communication between facilities is largely analogue, which increases the susceptibility to errors in treatment processes and inhibits the flow of information between care levels. RSSPMCC also benefits from the measures as the top reference level, which receives transfers from lower care levels.
- The FC project “Improving Health Care Delivery in the Aral Sea Region” (BMZ No. 2019 68 551, 2019 70 557), which aims to improve clinical knowledge and medical equipment in the field of cardiovascular diseases and to strengthen the referral system for stroke and cardiovascular diseases, is also a complementary project. Specifically, the aim is to equip primary care hospitals and health care facilities, improve the referral system for CVD and provide training for healthcare staff at all levels of care. Currently, primary care can only detect and treat CVD to a very limited extent and cannot fulfil its role as gate keeper for higher levels of care. Strengthening primary care and referral systems for effective follow-up treatment helps to simultaneously strengthen the tertiary level to which the RSSPMCC belongs.

In the 2022 intergovernmental negotiations with Uzbekistan, support for the introduction of a modern, comprehensive health insurance system was agreed as an additional field of bilateral cooperation in the health sector, with German TC being involved.

Overall, the project contributes to the achievement of the health-related SDGs (in particular SDG 3.4.1 “Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease” – as well as the former MDGs) in Uzbekistan and is thus consistent with international standards and norms to which German DC is committed.

6. External coherence

In order to improve the provision of medical services that require special treatment and advanced technologies, the government established four specialised centres in January 2003 including the RSSPMCC.¹⁵ As part of this FC project, the Uzbek government carried out extensive renovation measures at the RSSPMCC from its own resources as agreed. The complementary equipment of the Cardiology Centre with modern medical equipment thus supported the partner’s own efforts and built on existing structures.

At the time of the PA, institutionalised donor coordination with appropriately coordinated division of tasks did not exist, so donor activities were formally coordinated via the Uzbek Ministry of Health. A large number of international donors provided support in various areas of the healthcare sector: Basic health care (World Bank (WB)): Project Health-1, 1998–2004; Project Health-2, 2005–2012¹⁶), mother-child health (ADB), tuberculosis and HIV and AIDS prevention and control (GFATM), emergency care system (Spanish and Japanese governments).

In 2015, the “Health Sector Working Group on Aid Coordination” was set up for the first time as an attempt to ensure transparent donor coordination as part of a UNDP project led by the Uzbek side. However, this ended at the

¹⁵ Republic of Uzbekistan (2003): About measures for further reforming of health care system. Decree of the President of the Republic of Uzbekistan. №UP-3214

¹⁶ The two projects carried out large-scale PHC reforms in urban and rural areas by organising general medical care in rural areas and primary care in cities.

end of the project period. Since 2020, the “Country Platform” mechanism, led by the Uzbek government and supported by the World Bank, is intended to coordinate the respective sectoral interactions of the government with external development partners. Regular meetings are held at which the relevant ministries report on the activities. To facilitate dialogue and coordination within the community of development partners in the health sector in Uzbekistan, the informal “Health Partners Group (HPG)” was established in September 2023 (WHO – leading, TC, FC). The HPG holds monthly meetings.

With regard to the fight against NCD, the introduction of the “WHO Package of Essential Noncommunicable Disease Interventions (WHO PEN)” in two regions, Kashkadarya and Ferghana, was piloted in September 2015 as part of the Project Health-3¹⁷ financed by the WB with the support of WHO. It includes a range of essential and cost-effective interventions for the prevention, early detection and treatment of NCD in primary care, which can also be carried out in resource-poor environments. This has been supported by community-level interventions (“Sog'lom Hayot – Healthy Life”) to drive behavioural changes regarding relevant risk factors. Both general practitioners and nurses were trained and supported, resulting in better organization of care, greater division of tasks between doctors and nurses, and strengthening the role of nurses in health care supply.¹⁸ PEN is currently being introduced nationwide.

The Japanese government is currently supporting the prevention and control of NCD at primary level, rehabilitation after strokes and through training opportunities in Japan (e.g. endoscopic diagnosis, rehabilitation after strokes) as part of various projects.

There was no direct link between the project and the activities of other donors during the design and implementation phase, but the Kuwait Fund recently supported with funds in the amount of USD 5 million, which were used for the procurement of further modern technology in the field of cardiac surgery for the RSSPMCC. From an ex-post perspective, the various activities as a whole can be seen as a comprehensive package of relevant interventions in the subsector that supports the prioritisation of the health problem of CVD.

Rating summary:

The project takes a special position in terms of content in the context of other measures, as it was initiated at the specific request of the Uzbek government. It would certainly have made sense to integrate it with the TC project for the qualification of doctors and healthcare personnel in modern medical technology. On the other hand, the government's strong interest in its own efforts can be rated as very positive.

Coherence: 3

Effectiveness

7. Achievement of (intended) goals

The goal at outcome level was to improve the rapid diagnosis and targeted treatment of cardiovascular diseases at the Cardiology Centre. The intent was to achieve this by supplementing it with modern medical equipment.

The target achievement at outcome level is summarised in the table below:

Table: Target achievement outcome

Indicator	Status at PA (2009)	Target value PA	Actual value at PCR (as at 2020)	Actual value at EPE (as at 2023)
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¹⁷ The project aimed to improve the quality of medical services for outpatient and inpatient care at district and city level.

¹⁸ Sadirova et al. (2018): Improving cardiovascular risk in Uzbekistan: implementing a package of essential interventions to prevent and control noncommunicable diseases successfully involved nurses and found missing men.

(1) Number of patients treated (total) Inpatient Outpatient	21,919 6,758 15,161	Increase by 20%	25,126 6,887 18,239	42,758 8,818 33,940 Value achieved
(2) Reduction in average treatment time per patient (bed days)	9.1	(see text)	8.5	8.1 Value achieved
(3) Occupancy rates for beds	91%	/	61%	78%
(4) High-tech care				
Endovascular therapy¹⁹	(As at 2011)	/		
-Cardiological angiography ²⁰	552		1,733	1,263
-Percutaneous coronary intervention (PCI) with stent ²¹	175		920	453
-Other (including TAVI ²²)	0		1	0
Treatment of cardiac arrhythmia	(As at 2009)	/		
-Radio Frequency Ablation (RFA) ²³	10		163	173
-Implantation of pacemakers (2-chamber)	6		63	70
-Other	0		0	34
Cardiac surgery (open heart surgery)	(As at 2015)	/		
-Coronary artery bypass graft surgery (CABG)	89		337	163
-Valve implantation	11		128	75
-Combined procedures	4		86	27
-Other	10		48	22

¹⁹ Endovascular treatments are performed through the inside of blood vessels. Access to the vascular system is usually achieved by puncturing the large artery or vein in the groin using endoscopes.

²⁰ Procedure for visualising blood vessels affecting the heart using diagnostic imaging procedures.

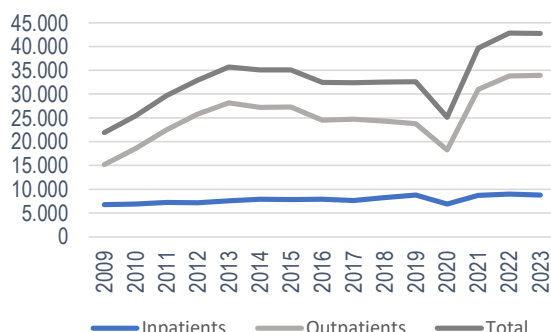
²¹ Percutaneous coronary intervention (PCI) is a procedure to dilate narrowed coronary vessels. This is done using a catheter that is inserted into the narrowed coronary vessel. Usually, a stent is inserted into the vessel at the same time to keep it permanently open.

²² Transcatheter aortic valve implantation: Narrowed or leaking aortic valves of the heart are replaced by inserting a folded replacement heart valve using a catheter.

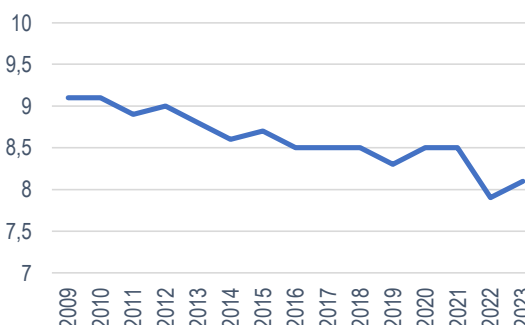
²³ Minimally invasive, non-surgical procedure that interrupts pathological impulses and nodes in the event of cardiac arrhythmia.

Indicator 1 shows a doubling of the number of patients treated (total) from 21,919 in 2009 to 42,758 in 2023, with a COVID-19-related decline as shown in Figure 3 a).²⁴

Figure 3: a) Number of patients treated



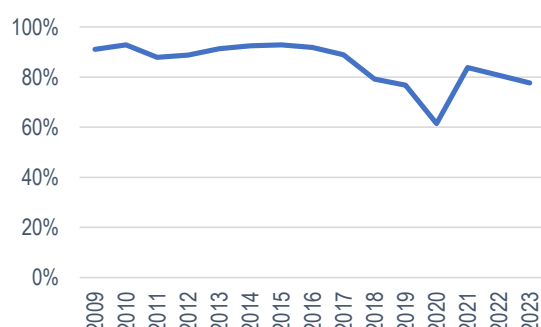
b) Average duration of treatment



Source: RSSPMCC; own data.

At the same time, a reduction in the inpatient length of treatment (**indicator 2**) can be observed (see Figure 3 b)), which was to be achieved through improved diagnosis and thus targeted treatment at the centre. With regard to the interpretation, it should be noted that a total number of 40,000 patients was used at the time of the appraisal, as the calculation of outpatients was still based on the number of clinic visits instead of the number of patients treated – regardless of the number of visits. However, this approach has not continued since 2010. Reports were also made that the

Figure 4: Bed occupancy rate



treatment duration was 35 bed days per patient in 2009. According to the consultant report, this is calculated as cumulative admission days and is therefore not collected by the centre. Instead, the average length of inpatient stay is used as an indicator. Both indicators 1 and 2 formulated at the time of the appraisal were achieved at the time of the evaluation.

With regard to inpatient utilisation, with the exception of the COVID-19 pandemic, there is an acceptable average bed occupancy rate (**indicator 3**) of 81%, see Figure 4.

Source: RSSPMCC; own data.

Over the past few years, the RSSPMCC has been able to significantly expand its technical scope (see **indicator 4**). While previously only conservative treatment methods using medication were possible, the diagnostic and therapeutic options expanded to include procedures currently used in developed countries; the FC measure made a significant contribution to this, as described below.

8. Contribution to goal achievement

The project was designed as an individual measure and the FC funds of EUR 3.0 million were exclusively used to purchase equipment for the RSSPMCC and consulting services in this context. The FC funds were used to procure a total of 46 pieces of equipment. These can be roughly divided into two groups: equipment needed in the context of diagnosing cardiovascular diseases (57% of the acquisition costs) and those used for treatment, mainly for cardiac operations but also for minimally invasive treatment by endoscopic procedures (together, 43% of the costs).

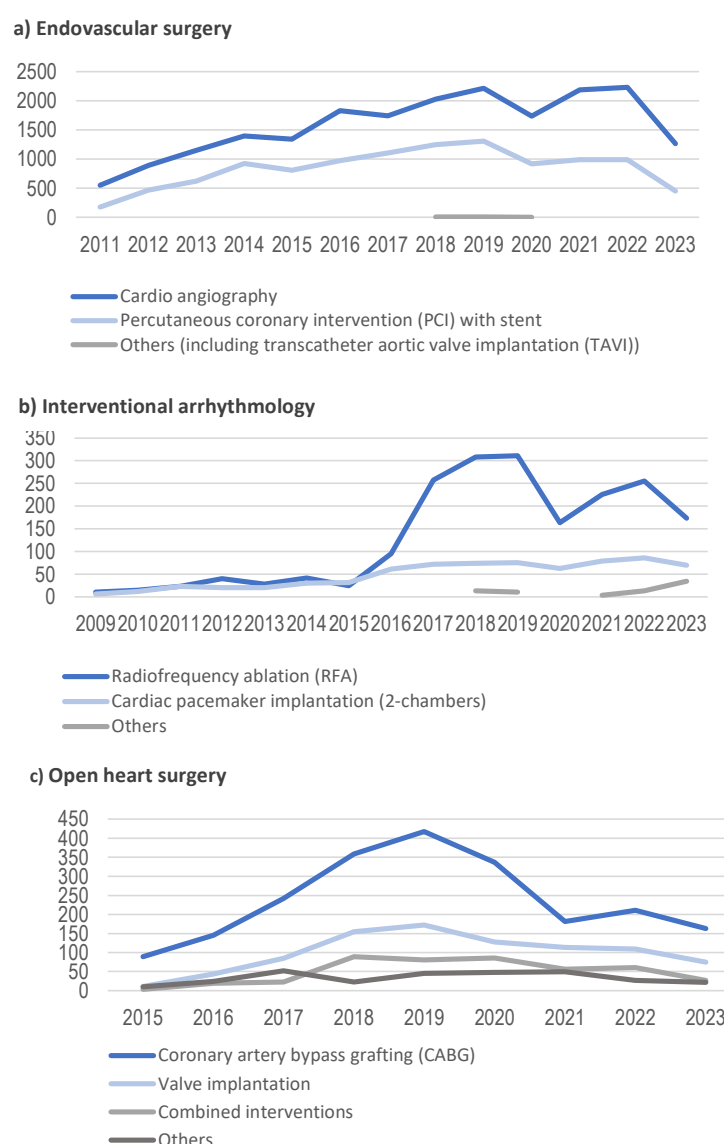
All diagnostic equipment was used intensively. For four out of the eight treadmill ergometry devices, the weight specifications were not complied with by the supplier and, despite multiple requests, these were neither replaced

²⁴ In March 2020 a government decision imposed a quarantine and temporarily suspended transport between the regions. For this reason, many patients from the regions were unable to be treated.

nor converted by the supplier nor the manufacturer. Nevertheless, the on-site visit showed that these devices were also used meaningfully and intensively for lighter patients, while heavier patients used the other treadmills. A blood gas and electrolyte analyser has been out of service since 2019. A device for measuring pressure drops in the peripheral vascular system could no longer be used since 2021 because the manufacturer did not want to supply a new software update despite multiple requests. In the area of therapeutics, the procured equipment was well utilised (except for an anaesthesia machine, which is now used as backup equipment).

The project has led to an improvement in the range of diagnostic procedures. Sophisticated equipment has been added for visual procedures (such as X-ray and ultrasound equipment). These enabled interventional treatment procedures (such as cardiac surgery) and minimally invasive methods to be performed via endoscopes. The laboratory has been upgraded to enable active hospital operations. Additional equipment supported a broader picture for detailed pressure analysis of peripheral blood vessels and facilitated differential diagnosis of heart disease with other upper body pathologies.

Figure 5: High-tech care (number of patients treated)



In therapeutic terms, the FC funds were able to contribute to major progress for the hospital in terms of minimally invasive and modern procedures for cardiac surgery. Before 2015, there were no surgical treatment options. Thanks to Uzbekistan's own contribution, the first operations were carried out in 2015. Between 2016 and 2023, the number of operations varied (also with lower figures in the years of the COVID-19 pandemic, among others), with an annual average of close to 460 surgeries in just two operating theatres (Fig. 5c). The most commonly performed surgeries were bypass surgeries (Ø 260 per year) to overcome arteriosclerotic blockages in coronary vessels to maintain oxygen and nutrient supply to the undersupplied heart muscle cells. Heart valve replacement surgery was often performed (Ø 110 per year). Challenging treatments for multiple heart problems in an operating room and various other surgeries took up the rest. Minimally invasive procedures have been performed very frequently: Close to 1,000 stents alone per year on average (see Fig. 5a). Complex combined procedures such as replacement of a defective heart valve with a bypass of the coronary artery (see Fig. 5c) were also performed. Figure 5 summarises the development of modern procedures in a visual format (comparison indicator 4).

Source: RSSPMCC; own data.

The most recently observed decline in treatment rates, in addition to the COVID-19-related downturn as shown in Figure 3 a), is mainly due to the failure of an angiography device, which has now been repaired and is in use, according to the Cardiology Centre. The explanation seems plausible as these devices can be used in

combination, both diagnostically and surgically, i.e. failure means fewer diagnoses, fewer minimally invasive procedures, but also fewer surgical interventions due to the lack of diagnosis. At the same time, it is conceivable that the socially disadvantaged patients no longer admitted (see explanation on the next page) may have had an effect. The increasing proportion of decentralised centres, which now also use modern procedures, may also have contributed to this effect.

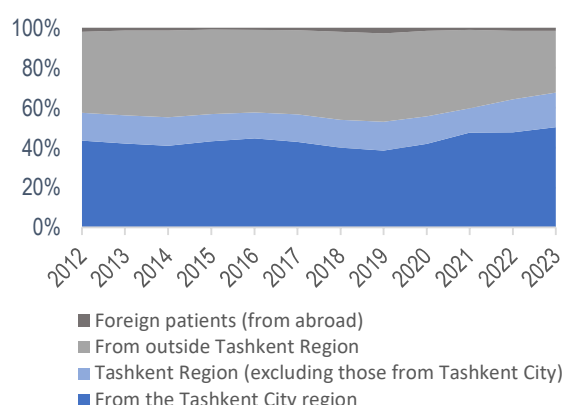
According to hospital management, the hospital currently has 99% of the equipment recommended by international cardiology organizations. Overall, the technological backlog of about 30–40 years in cardiovascular medicine has gradually been almost completely caught up.

In this sense, the project has achieved the objective at outcome level of rapid diagnosis and targeted treatment of cardiovascular diseases quite well. However, considering the high number of treatments in RSSPMCC in the national context, they are not significant given the widespread prevalence of cardiovascular diseases affecting more than 5% of the total population. Even if most patients do not need immediate intensive treatment, the need is many times too high for a single centre. Apart from this, the enormous distances to be covered in the country are too great for those affected outside the greater Tashkent region, so only a decentralised approach would make sense in a large-scale territorial state such as Uzbekistan.

The centre is the country's highest reference level for cardiovascular diseases and is responsible for the entire population on a state level, i.e. open to referrals of patients of all income groups from the subordinate health facilities. Payment for the services is made in accordance with the Uzbek government's official additional payment catalogue and is covered for vulnerable parts of the population from a benefit package. As part of this, on average – at a relatively constant level – 16% of inpatients and 8% of outpatients were treated annually at the Cardiology Centre without out-of-pocket payments (examined for the period between 2009 and 2020). However, until 2021, the benefit package only covered conservative treatment methods through medication, i.e. in the first years of operation (use of the FC-financed equipment consecutively from 2016, the year of the first delivery), access to the therapeutic technologies was reserved for self-paying patients. With regard to the FC-financed equipment and its use, this means that poor patients only had financially reimbursed access to a limited group of devices – this corresponds to 49% of the procurement costs (all diagnostic devices with the exception of an X-ray device, which is used exclusively in the operating room and only benefited self-payers, while four pieces of defibrillation equipment were available to all patients for severe cardiac arrhythmias). In this respect, vulnerable population groups only partially benefited directly from the project.

Only since the introduction of a new financing system via a state insurance fund (for Tashkent from 2021) do vulnerable population groups have financially covered entitlement to these types of treatment techniques. However, the centre had hardly received any reimbursements for interventions up to the time of the EPE, according to the centre's information, due to a lack of funds available from the insurance fund. A significant increase in the budget from 2024 was expected to remedy this misconduct.

Figure 6: Patient backgrounds



In addition to the poorest and weakest population group, treatment costs can also be a significant burden for the lower and middle income groups. For example, the cost of stenting is around USD 1,500–1,600 (plus travel costs, daily allowances for inpatient accommodation, etc.) with a current average monthly income of USD 389. For people living outside Tashkent, travelling to the capital to use the services also involves direct and indirect costs. It is therefore not surprising that most patients (67.6%) in 2023 came from the city of Tashkent (50.2%) and the region of Tashkent (17.4%), as well as 30.9% from regions beyond Tashkent, and 1.5% visited the centre for treatment from abroad (Figure 6).

Source: RSSPMCC; own data.

At the same time, it must not be overlooked that there were practically no options for interventional cardiovascular treatment in the country before. For this purpose, patients had to be treated mainly abroad, which was

associated with considerable costs that a large proportion of the population could not afford. In this respect, the FC investment contributed to important qualitative progress in terms of the possibility of treatment in the country.

Moreover, given the financially tight health budget and the multitude of challenges posed by the reform of the health system as a whole, it seems understandable that the state's assumption of costs for the outputs of new therapeutic technologies was not and could not be a priority at the outset. **Equipping the centre at the highest reference level was an essential step for the overall development of the health care system in order to build up knowledge about the treatment of cardiovascular diseases using modern technologies and thus lay the foundation for nationwide expansion.** Only the expansion of the RSSPMCC into a modern cardiologist treatment centre made it possible to expand modernisation throughout the country (see section on broad-based impact).

As described, the SHIF now also aims to provide financial protection for vulnerable population groups for sophisticated diagnosis and treatment. To this end, the state has now significantly increased its financing for the health sector and, above all, for the SHIF. This also means that patients are now entitled to all treatment techniques in the RSSPMCC. As the SHIF was introduced after the project was completed, the direct poverty impact was limited, but there was certainly an indirect poverty impact. It is questionable to what extent this development was foreseeable at the time of the appraisal. Nevertheless, it can be argued ex-post that the poor also benefit significantly from the measures in the long term.

Overall, the centre's high level of commitment and state support were important factors in achieving the intended objectives. The state co-financed the project with (1) the reconstruction of the fifth floor of building No. 4 to create a cardiac surgery department, (2) the construction of an oxygen extraction system and equipment, and (3) the construction of a new three-storey building. The aim was to expand the centre's cardiology offering both quantitatively and qualitatively, which was accompanied by parallel, largely state-funded basic and advanced training measures and increased staffing.

9. Quality of implementation

According to the appraisal concept, the body implementing the programme was the RSSPMCC, which reports directly to the MoH (executing agency). All action-specific decisions were made directly with the centre's management team, which, according to the project completion report, has been decisive and goal-oriented in terms of personnel continuity over the years. The on-site discussions confirmed the impression of the centre as a competent project partner in the design, implementation and use of the project. The Uzbek government also provided direct support – as already described in the last section – with a high counterpart contribution, which exceeded the original estimate. This should be seen as a significant sign of high ownership.

As of August 2015 following the insolvency of the international consulting firm, the consulting tasks were taken over by the local subcontractor, who took over the preparation of the tender documents, the execution of the various tenders and the follow-up for the supply contracts to a very satisfactory extent (see section on efficiency).

10. Unintended effects (positive or negative)

In the absence of adequate financial hedging mechanisms to utilise treatment offerings, the introduction of new technologies may initially lead to an aggravation of inequalities if only privileged parts of the population can bear the cost of treatment. As described, scarce resources initially prevented the state from fully assuming the costs for the entire spectrum of treatment options for vulnerable groups promoted under the project.

Rating summary

Overall, it seems undisputed that the project made a positive and important contribution to the rapid diagnosis and treatment of cardiovascular diseases at the Cardiology Centre, and this development was exceptionally supported by a high level of commitment from the centre and the government. This now enables interventional treatment of heart and vessels in the country itself and thus addressed the previously existing bottleneck at the level of tertiary care.

The aim is to ensure equal access for all patients to the *entire* range of services, which had not yet materialised at the beginning – a deviation from the project's concept. However, the overall very positive developments and the increase in the budget in 2024 suggest that these inequalities will be reduced in the future, so that vulnerable

people will continue to benefit from the high-quality services. Taking these aspects into account, the effectiveness of the project is rated as successful.

Effectiveness: 2

Efficiency

11. Production efficiency

A total of EUR 7.02 million was invested to improve the possibilities for the diagnosis and targeted treatment of cardiovascular diseases (input). Of this, 42.3% was borne by the FC contribution and 57.7% by the Uzbek side as a counterpart contribution. The Uzbek government carried out renovation measures at the Cardiology Centre between 2014 and 2018, significantly exceeding the original estimate of EUR 0.3 million.

However, as is often the case in Uzbekistan, the implementation of the project was significantly delayed. The original plan was to implement the project within 24 months, i.e. in the period from 2011 to 2013. In fact, the implementation took place after the consultant began work starting in March 2013 with the delivery and installation of the equipment taking place between 2016 and 2020. The reasons for the several-year delay were the lengthy coordination of tenders and contracts and the insolvency of the consulting firm, whose task was taken over by the local subcontractor starting in 2015. In the course of the implementation, a total of three tenders with 21 lots were carried out as well as a price query. With residual funds and deducted penalties, three additional equipment units were procured by means of a price query.

With regard to coordination and management costs, a share of 6.7% (i.e. EUR 200,000) of the total costs was provided for the implementation consultant, which generally seems appropriate for a high-tech procurement project. However, EUR 150,661.50 was attributable to the first consulting firm, which filed for insolvency after a short period of time, and only EUR 49,338.50 to the local, original subcontractor, which took over the order and thus performed the actual contract work. In addition, an advance payment of EUR 7,400 was made to the international expert who was expected to continue leading the consultant team, but who did not perform his obligations. Overall, this led to a slight increase in coordination and management costs, from 6.7 to 6.9% – however, the distribution of these costs is ultimately more serious and inefficient, as a large part did not benefit the project due to the insolvency.

It is remarkable that the local subcontractor only managed with a quarter of the estimated consulting costs. On the other hand, there is a high administrative expense due to the high number of individual contracts to be awarded, which delayed procurement, but led to a very satisfactory result. The large lot divisions led to reasonable procurement prices, which justify this expense in retrospect.

12. Allocation efficiency

For several decades, Uzbekistan has had a worryingly high proportion of cardiovascular mortality, keeping it at the top of the group of WHO-Europe countries. Therefore, since the first decade of this century, the country has led a constantly evolving programme to prevent and treat the group of diseases that are largely caused by sedentary lifestyles, high-fat diets, as well as cigarette consumption and alcohol abuse. As in all countries with this problem (including Germany, especially in the early second half of the 20th century), the focus of the programme was on better treatment of the sick and the prevention of complications in patients with pre-existing conditions, while measures aimed primarily at healthy lifestyles for large populations are very expensive and labour-intensive due to the very complex and decades-long focus. However, the latter have a significantly better cost-benefit ratio in the long term.

For participation in primary prevention measures aimed at significant behavioural changes in the general population, the manageable FC funds could not have contributed to any significant impact in a short period of time.

In addition, in populations with such a high burden of cardiovascular disease, there is strong pressure on policy-makers to focus first on better treatment of visibly ill people. FC's approach therefore targeted this issue.

The expansion of the treatment options of a national cardiology centre to an internationally high level was a long-term strategy in which the FC-financed equipment in combination with state measures was an initial programme

that led to a qualitatively significant expansion of the treatment offer in the RSSPMCC. With this and further investments, the centre was able to develop into a real national reference and teaching hospital. As part of this capacity and competence expansion of the RSSPMCC, the cardiologists of the regional cardiovascular hospitals were able to significantly expand their performance competences in a second step (spill-over effects) under close supervision by and in cooperation with the RSSPMCC. At the same time, funds were made available to be able to procure the technologies required for their level there as well.

Although the cardiology centre in Tashkent can only treat a relatively small proportion of the national disease burden in cardiovascular diseases, today the investment still appears to be the best possible intervention at the time of the appraisal and implementation in terms of its size and within the objective at outcome level (improving diagnosis and treatment). This has enabled the rapid further development of the centre on an international level with new diagnostic and therapeutic possibilities.

The centre is currently performing interventional cardiovascular procedures, including surgery. Since the *Republican Surgery Centre* in Tashkent also has a cardiac surgery department, a concentration of cardiac surgery services in a single centre could lead to economies of scale in the expansion phase of interventional cardiovascular medicine.

Rating summary

There were significant delays in the implementation of the project and the allocation of consultancy costs also seems to be inefficient. Nevertheless, the overall objectives were achieved in an economically efficient manner and the available financial resources were allocated efficiently.

Efficiency: 3

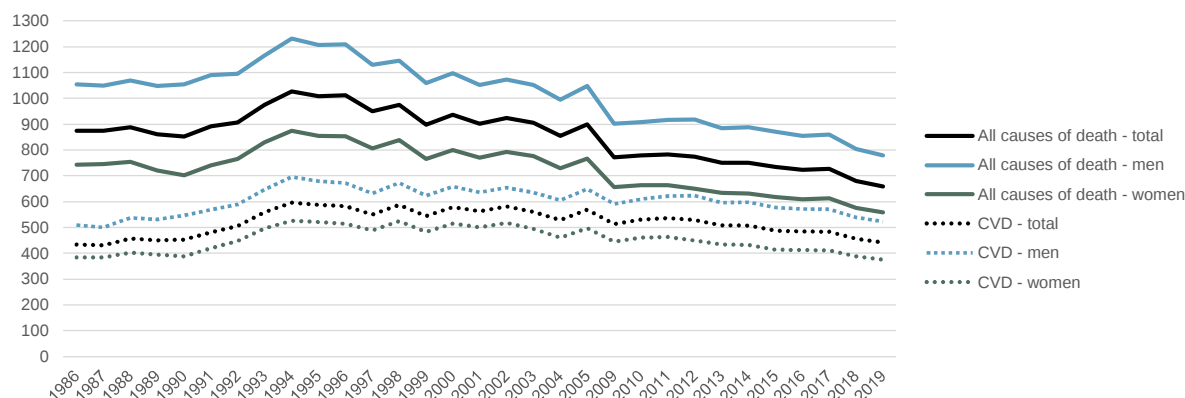
Impact

13. Overarching (intended) developmental changes

The objective at impact level of the project was to improve the health status of the Uzbek population. According to the wording, the achievement of the objective was considered to have been achieved at outcome level during the appraisal and no impact indicators were defined in this respect. As part of the evaluation, the development of the overarching development policy changes is mapped using the following indicators: deaths per 100,000 inhabitants (age-standardised) due to CVD, proportion of deaths due to CVD, and the likelihood of dying from cardiovascular disease, cancer, diabetes, or chronic respiratory disease between the ages of 30 and 70.

Figure 7 shows the development of deaths per 100,000 inhabitants (age-standardised) due to CVD compared to the development of all deaths in Uzbekistan. Similar to the overall development, CVD-specific mortality rates show a declining trend from 529.8 in 2010 to 441.9 in 2019, with rates differing significantly between men and women. While the CVD-specific mortality rate for men in 2019 was 522.9, it was only 375.2 for women.

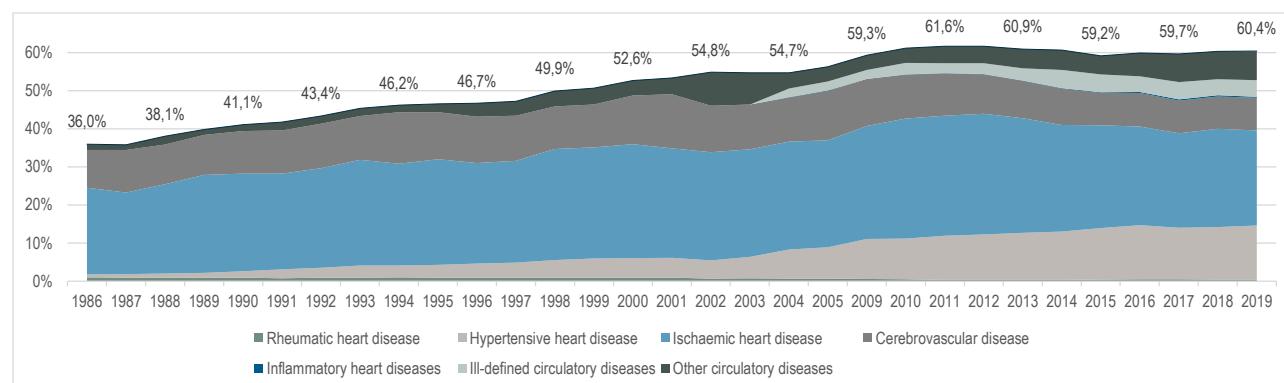
Figure 7: Deaths per 100,000 inhabitants (age-standardised) due to CVD compared to the development of all deaths in Uzbekistan



Source: WHO Mortality Database; own presentation.

Nevertheless, cardiovascular disease remains the leading cause of death in Uzbekistan. While there was a continuous increase up to the time of the PA, the proportion of deaths due to CVD has since stagnated at a plateau of around 60% (see Figure 8) and is thus responsible for 93,260 deaths in 2019. Ischemic (also known as coronary) heart diseases, i.e. diseases of the blood vessels that supply the heart muscle, are dominant, accounting for 41% of all CVDs in 2019. The second most common cause of death in 2019 was hypertensive heart disease – a disease of the heart muscle caused by chronic high blood pressure, the proportion of which increased significantly over the period under review. Cerebrovascular diseases, i.e. diseases of the blood vessels that supply the brain, including strokes, have caused between 9 and 12% of all deaths since 2010.

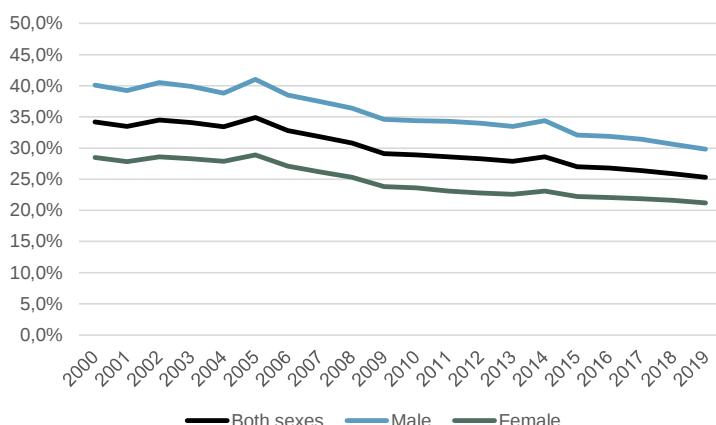
Figure 8: Proportion of deaths due to CVD



Source: WHO Mortality Database; own presentation.

The likelihood of dying from cardiovascular disease, cancer, diabetes or chronic respiratory disease between the ages of 30 and 70 is 1:4 (last available value: 2019), with men (29.8%) significantly more likely to die than women (21.2%), see Figure 9. Although the probability of premature death fell from 28.9% in 2010 to 25.3% in 2019, it is still more than twice as high as the EU country average. The United Nations Sustainable Development Goal is to reduce premature mortality due to NCDs by one third by 2030 (SDG 3.4.1).

Figure 9: Probability of dying from cardiovascular disease, cancer, diabetes, or chronic respiratory disease between the ages of 30 and 70



Source: WHO Global Health Observatory; own data.

14. Contribution to overarching (intended) developmental changes

It can be assumed that the project contributed to improving the health situation of the population at a higher development policy level. Intact infrastructure is, among other things, a necessary prerequisite for the population to have access to and use health services. The bottleneck existing at the time of the PA (i.e. insufficient equipment of the Cardiology Centre with modern medical devices) was specifically addressed by the project so that the centre can properly perform its reference function and fulfil its care mission.

In terms of methodology, it should be noted that the FC funds, which are limited to EUR 3 million, selectively only promoted the quality of the diagnosis and treatment of cardiovascular diseases very selectively through providing supplementary equipment for the Cardiology Centre at the highest reference level and thus an exact attribution of the effects to the FC project is not possible. In addition, it is conceivable that other measures or external circumstances may also have had an influence on the impact objectives, which are not directly related to the financed measures. It therefore seems obvious that the government's initiatives for the prevention of NCD, such as national health education on risk-reducing behaviours for the prevention of chronic diseases (including cardiovascular diseases) as well as systematic screening measures for chronic diseases, had a positive impact on the achievement of the intended development policy objectives, while the COVID-19 pandemic in 2020/21 meant a setback.

The project supported national efforts to establish quality standards in the treatment of cardiovascular diseases through the expansion of the centre's capacity and competence. The positive spillover and multiplier effects the project intended for the subordinate reference system (regional level) also appear plausible: For example, the Cardiology Centre's knowledge transfer takes place in the form of in-house training, regular further training courses at the branches and universities, annual national congresses and international conferences, and scientific research. The centre is connected to all 13 branches (12 regions and Karakalpakstan) and offers both methodological and practical support. The on-site discussions with the management of various regional hospitals demonstrate the good and close cooperation with the RSSPMCC – depending on their own regional range of services. In complicated cases, online consultation is possible and, if necessary, a specialist from the centre travels to carry out on-site interventions.

Overall, the project had broad-based effects. The expansion of the RSSPMCC into a modern cardiological treatment centre enabled the expansion of modernisation throughout the country in the sense of decentralisation with similar, albeit smaller, cardiological hospitals in the regions with a range of services that was less broad; these will serve as reference centres for local health facilities in the future. Although the range of services offered by the regional cardiology centres varied greatly, their competences continued to increase. Without a national centre that has internationally trained physicians and, in addition to the treatment and university teaching mandate, also carries out the national further training of cardiologists and a quality control function, such a swift, broad introduction of new technologies would not have been possible.

15. Contribution to overarching (unintended) developmental changes

There are no indications of overarching (unintended) developmental changes.

Rating summary

Overall, the impact can be assessed as successful.

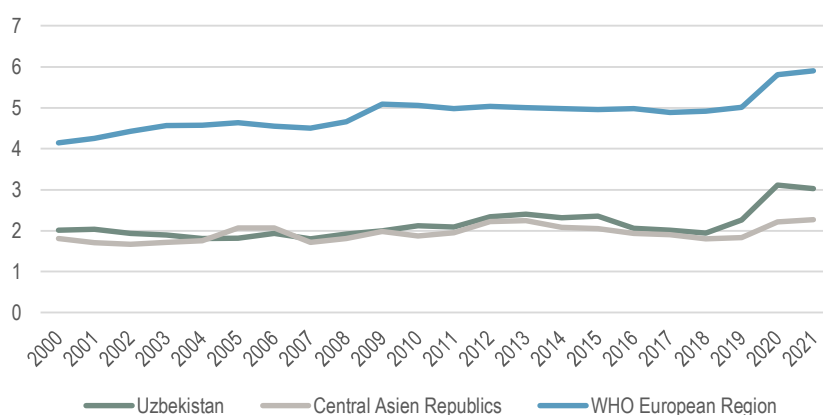
Impact: 2

Sustainability

16. Capacities of persons concerned

Taxes are the main source of government revenue for the health system. In 2021, public spending on health accounted for 3% of gross domestic product (GDP), which was above the Central Asian average of 2.3%, but well below the WHO European region average (5.9%), see Figure 10.

Figure 10: State healthcare expenditure as a percentage of gross domestic product (GDP)

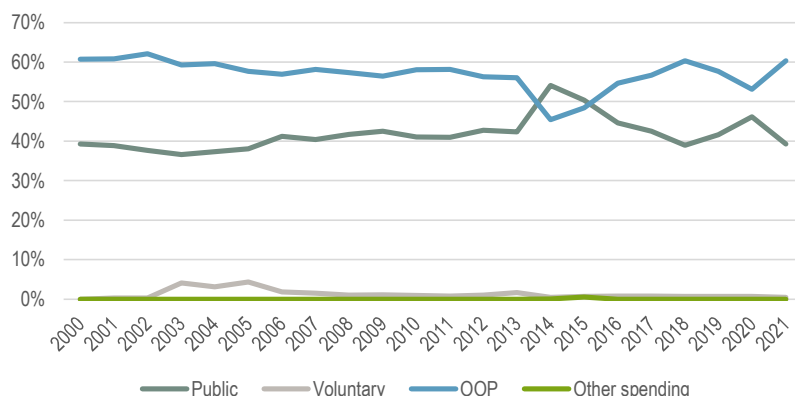


Source: WHO Global Health Expenditure Database; own data.

Well over half of all health care expenditure in 2021 (60.3%) was financed from out-of-pocket (OOP) payments. The state assumed close to 40%, see Figure 11. The high OOP share illustrates the challenges of financing medical services in the event of illness for the Uzbek population, in particular for poorer households and people with health problems not covered by the state service package. OOP payments must be made whenever (1) diagnostic or treatment services are provided by “specialised” public health providers – except for patients belonging to priority groups who are entitled to receive these services free of charge; (2) when diagnostic or treatment services are provided by private health providers; as well as for (3) medicines and consumables not covered by the government service package. The high share of OOP spending poses a significant risk to poorer households. Close to a fifth of households reported having been affected by catastrophic health spending in 2018.²⁵

²⁵ WHO (2022): Health Systems in Action – Uzbekistan.

Figure 11: Financing healthcare in Uzbekistan



Source: WHO Global Health Expenditure Database; own data.

At the level of the Cardiology Centre itself, from the point of view of the evaluation, there is generally no doubt that the positive effects can be sustained over time.

- Like all tertiary sector institutions, the centre follows a self-financing model, so approx. 95% of the budget is from revenue it generates itself and only the rest is borne by state funding. As shown in the section on Effectiveness, there has been a qualitatively significant expansion of the treatment range and an increasing number of patients in recent years.
- At the same time, the hospital's staffing has been significantly increased since the PA (physicians by approx. 30%, nurses by over 60% and paramedical professionals by close to 50%) in order to serve the wider range of treatment options. Overall, the visitation showed a high level of professionalism, commitment and ownership of the staff as well as excellent management.
- The building infrastructure as well as the equipment with materials make a good impression for the most part. Patients are hospitalised in two- to four-bed rooms and seem to be satisfied. The atmosphere is positive and conducive to recovery thanks to the generous construction with installations of greenery.
- Although the hospital pharmacy is well-equipped, the staff there and in the treatment departments do not report any significant downtime for drug availability (apart from the globally known logistics problems during the COVID-19 pandemic). Only in the laboratory were there periods when reagent supplies dwindled and had to be procured internationally. Uzbekistan plans to strengthen the national pharmaceutical sector in order to become more independent of foreign procurement.
- With regard to the project's concrete measures, i.e. the supplementary equipment of the Cardiology Centre with modern medical equipment, it is essential that part of the Cardiology Centre's budget is provided and spent on (preventive) maintenance and corrective maintenance. According to the Centre, approximately 15–20% of the costs for maintenance are incurred annually, which generally seems appropriate for sophisticated equipment (see also section below discussing "Durability of effects over time").

Since the introduction of SHIF, the reimbursement of medical services for vulnerable parts of the population, which are covered by the benefit package, is only made retrospectively, i.e. there is no longer any advance payment by the state. The lack of prefinancing poses a challenge for the Centre in terms of the provision of services, as it turned out that reimbursement is delayed significantly. Since 2021/22, there has been a sharp downturn in the treated, vulnerable patient group. This was due to insufficient funds in SHIF, which is to be increased further in the future. The on-site evaluation discussed the positive aspects of a pre-financing mechanism to provide health services to vulnerable groups.

As described above, OOP expenses can be an extreme financial burden and therefore an obstacle to the use of health services. In this respect, it is essential that the Uzbek health financing system continues to advance social protection mechanisms.

17. Contribution to support for sustainable capacities

Healthcare services can only be provided (and used) sustainably if the appropriate infrastructure exists and is functional. The project's improvement in the quality of diagnosis and treatment at the highest reference level helped the Cardiology Centre to fulfil its reference function, expand competences and generate knowledge transfer for lower levels of care. Payment for the services can also increase revenue and, if necessary, use it for further investments, which has a positive impact on the sustainable inventory of capacity.

As medical equipment has a (limited) useful life, the centre will be able to maintain positive effects from a purely technical side – depending on maintenance and servicing (see next section) – (at least for a certain period of time).

18. Durability of effects over time

The durability of effects over time in relation to the specific measures of the project is closely linked to maintenance, servicing and user care.

All the equipment procured as part of the project could be inspected on site, with the exception of the surgical instruments that were currently in use. Overall, the condition of the equipment was very satisfactory. With the exception of a device for measuring pressure drops in the peripheral vascular system, which cannot be used after 2021, and a blood gas and electrolyte analyser (out of service since 2019), all diagnostic equipment was in good and well-maintained condition. The therapeutic equipment was also in good condition in the, with the exception of one anaesthesia machine, which is now available as backup equipment.

The hospital only has a small maintenance team (consisting of a medical engineer and an employee) with a workshop that is not exceptionally well equipped. It is surprising that this team can handle all the maintenance for the hospital technology. As described, the evaluation did not reveal any obvious defects in the devices. Similarly, hospital staff seem to have a high level of ownership, so equipment defects are immediately reported and then repaired.

Due to the fact that foreign companies rarely have branches in Uzbekistan, there are few maintenance contracts in the sense of outsourced preventive maintenance. This only includes laboratory equipment and Philips high-tech equipment. The maintenance service for Siemens equipment is provided by external companies as required. The other equipment is the responsibility of the hospital's maintenance department, or preventive maintenance is not performed, which is acceptable for some of the items as it does not reduce the service life.

According to the maintenance engineer, he and his employee carry out repairs, or local experts from suitable companies are commissioned. He is also responsible for contacting suppliers and manufacturers for repairs of major defects and books repair teams or orders spare parts and up-to-date software.

As a minor flaw, it was determined during the EPE that user manuals were no longer available. On the whole, the good condition of the equipment is nevertheless surprising, especially in the FC comparison. This is a positive example of how good maintenance and care in an environment with scarce resources can have a significant impact on the service life. The results show that good leadership and employee engagement are crucial to all aspects of quality management.

The project's impacts are embedded in national efforts to combat the main causes of premature mortality. The Presidential resolution of 26 January 2022 no. PP-103 specifically addresses measures to prevent and improve the quality of treatment of CVD. The programme for the further development of cardiological services in 2022–2024 includes the following:

- I. the improvement of the legal and regulatory framework and laws governing the cardiology department, as well as the digitalisation of the department
- II. the early detection, prevention, diagnosis and improved treatment of CVD
- III. improving the professional and scientific potential of cardiology staff and the development of science in cardiology
- IV. the transformation of the activities of the RSSPMCC and the cardiology departments within the district (city) associations

IV. specifically refers to the modernisation of the material and technical basis of the RSSPMCC to improve the quality of medical services, diagnostics and cardiological procedures. For this purpose, further modern technology in the field of cardiac surgery has already been procured with resources from the Kuwait Fund (USD 5 million).

Rating summary

The development of the RSSPMCC, which has made great progress in terms of the technical spectrum, with opportunities for procedures that are currently also used in developed countries, can be assessed as very positive. The high level of professionalism, good management and commitment of the centre, which was also reflected in the maintenance, servicing and user care of the medical equipment procured under the project, contributed significantly to the development and expansion of advanced diagnostic and treatment services. According to the level of knowledge at the time of the evaluation, it can be assumed that the positive effects will continue even after the end of the project. Development is accompanied by political efforts to combat the main causes of premature mortality and to achieve adequate treatment quality for CVD.

The high share of OOP spending remains problematic, representing a significant financial burden for large parts of the population and thus a risk associated with the option of using specialised health services.

Sustainability: 2

Overall rating

Reducing premature mortality in the population due to cardiovascular diseases through appropriate medical care remains of great relevance and is one of the declared goals of the Uzbek government. In this respect, the FC project supported the partner's high level of in-house efforts by equipping the cardiology centre in Tashkent with modern medical devices. The FC project occupied a special position in the DC landscape, whereby stronger integration with TC would have certainly led to positive synergies. As is often the case in Uzbekistan, implementation was delayed considerably – however, the procurement of the equipment, which was independently proposed by the Cardiology Centre, provided very satisfactory results overall. The majority of the equipment procured is in good use and in very good condition appropriate for the time it has been used. The FC funds contributed to an improvement in the range of diagnostic procedures and to major progress in the therapeutic area, as minimally invasive and modern procedures for the treatment of CVD were only made possible by the project, as there was previously practically no option for interventional treatment of heart and vascular diseases in the country. The project thus addressed an important bottleneck at the level of tertiary care. With FC funds and further investments, the centre was able to develop into a real national reference hospital, which achieved broad-based effects for the subordinate reference system as part of a knowledge transfer. Since 2021, with the introduction of SHIF for vulnerable groups, there has been a financially covered entitlement to services from the new therapeutic technologies, whereas previously only the costs for conventional treatment offerings were covered. Since large-scale investments in new technologies can initially come at the cost of the disadvantaged population, it is *important* to provide sufficient resources *at an early stage* of the process to use appropriate mechanisms to safeguard these population groups in the event that technologies expand. Based on the level of knowledge at the time of the evaluation, it can be assumed that these inequalities will level out in the future due to the overall positive developments.

Overall, the centre's equipment, in the sense of an initial measure, has led to important, qualitative progress in the treatment options for cardiovascular diseases using modern technologies. This laid the foundation for nationwide expansion. Therefore, despite existing critical aspects, the project is rated as successful overall (close to 2). **Contributions to Agenda 2030**

The project directly contributes to SDG 3 "Good health and well-being" and in particular to SDG 3.4.1., i.e. to reduce premature mortality due to NCDs by a third by 2030.

It has not yet been explicitly aligned with ecological objectives.

Project specific strengths/weaknesses and general conclusions/lessons learned

The project had the following strengths and weaknesses in particular:

- The partner's high level of counterpart contributions and the centre's high level of professionalism, leadership and commitment contributed significantly to the development and expansion of the advanced diagnostic and treatment range.
- The high level of ownership and user diligence of the Centre's employees – despite scarce resources – had a very positive impact on the useful life of the supplied equipment.
- The applicable legal framework conditions were neglected in the design insofar as vulnerable groups only had financially reimbursed access to certain treatment methods and thus could only partially benefit from the FC-financed equipment until 2021.
- Implementation was significantly delayed due to lengthy contract adjustments and tender decisions as well as the insolvency of the international consulting firm.

General conclusions and lessons learned (at least three):

- When formulating the target group that is to benefit from the measures, it must be ensured that the applicable legal framework conditions in the partner country are consistent with the targeted impacts.
- Since large-scale investments in new technologies can initially come at the cost of the disadvantaged population, it is important to provide sufficient resources at an early stage in the process to financially secure the groups' participation in the improved treatment offering through appropriate mechanisms in the event that the technologies expand.
- The fact that the hospital independently defined the procurement list for medical equipment can have a very positive impact on ownership.
- With regard to the maintenance of high-tech equipment, it is helpful to ensure that the manufacturers have branches in the country when selecting the equipment so that appropriate maintenance contracts can be concluded.
- Individual projects can achieve greater positive direct and indirect impacts under suitable framework conditions in the sector (in particular as initial financing at the highest reference level for enhancing technological capabilities), especially with a high degree of ownership at the political level, as well as from the executing agency. Subsequent investments that promote further decentralisation of treatment at subregional level can build on this.
- In the sense of a holistic approach to sustainable development, it is relevant to consider rehabilitation options in addition to diagnosing and treating diseases.

Evaluation approach and methodology

Ex post evaluation methodology

Ex post evaluations follow the approach of a rapid appraisal, i.e. a data-supported, qualitative contribution analysis resulting in an expert opinion. Effects are attributed to the project considering plausibilities, based on thorough analysis of documents, facts and impressions. This includes – if possible – the use of advanced technology (e.g. satellite imagery, online interviews, geocoding). There is a follow-up on possible conflicting information, attempting to eliminate inconsistencies and to base the rating on information that – to the extent possible – has been confirmed through different sources (triangulation).

Documents:

Internal project documents, secondary specialist literature, strategy papers, context, country and sector analyses, decrees from the President of the Republic of Uzbekistan

Data sources and tools for analysis:

(Digital) databases, on-site data collection, partner monitoring data

Interview partners:

Project-executing agency, programme-implementing body, employees of the cardiology centres, other donors, internal project managers

The analysis of project effects is based on the theory of change defined at project appraisal and documented within the impact matrix, which may be updated for the purposes of the evaluation. The evaluation report argues which factors contributed to the observed effects and why – as well as the probable extent of the project's contribution (contribution analysis). The context of the project is taken into account concerning its influence on the results. The conclusions are put into perspective regarding the availability and accuracy of the available data. The framework of the evaluation is established by the evaluation conception.

This method provides a balance between cost and usefulness, generating evaluation findings with appropriate effort and expense. Also, it allows for a systematic success rating across the FC projects. Thus, an isolated ex post evaluation cannot fulfil the requirements of a scientific assessment in the sense of a strict causality analysis.

The following aspects caused limitations for the evaluation:

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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 that clearly exceeds expectations
- Level 2** successful: fully in line with expectations and without any significant shortcomings
- Level 3** moderately successful: project 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: the project has no impact or the situation has actually 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 ("impact") and the sustainability are rated at least "moderately successful" (level 3).

List of abbreviations:

FI	Final inspection
GDP	Gross domestic product
BMZ	German Federal Ministry for Economic Cooperation and Development
EUR	Euro
FC	Financial cooperation
FC E	FC evaluation
HDI	Human Development Index
MoH	Ministry of Health
PA	Project appraisal
PP	Project proposal
RSSPMCC	Republican Specialized Scientific and Practical Medical Center of Cardiology
TC	Technical cooperation
USD	US dollar

The annex to this report is available upon request (german only).

About this publication

Responsible

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