KfW Development Bank

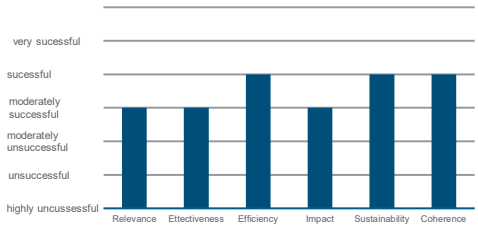
Ex post evaluation
Rural healthcare III, PR China

Title	Rural healthcare III		
Sector and CRS code	Basic health infrastructure, 12230		
Project number	2011 66 735		
Commissioned by	Federal Ministry for Economic Cooperation and Development, BMZ		
Recipient/Project-executing agency	Ministry of Finance of the People's Republic of China/district hospitals		
Project volume/ financing instrument	EUR 14,8 million/composite financing		
Project duration	December 2012 – June 2019		
Year of report	2021	**Year of random sample**	2020

Objectives and project outline

The outcome objective of the FC project was to increase the use of the health services that have been improved in terms of both quantity and quality in three district hospitals. This was intended to contribute at impact level to improving the health situation of the population living in the poorer, more rural, northern and western provinces of China. The measures financed with FC funds included the procurement of modern medical and hospital equipment. The counterpart contribution was used to finance construction work for expansion and rehabilitation, maintenance costs and training.

Overall rating:
moderately successful



Key findings

It is plausible to assume that the FC project made a contribution, albeit limited, to improving the health of the population living in the project provinces (impact) and thus helped to reduce disparities between rural regions and economically developed urban areas. Nationwide, urban rural disparities in maternal mortality were eliminated and disparities in child mortality significantly reduced by 2019

- As a result of the FC measure, the hospitals were able to expand the range of healthcare services both qualitatively and quantitatively, adapted to the changed burden of disease, and to increase the use of the services (effectiveness).
- However, it can be assumed that healthcare services making use of equipment financed under the FC project will incur out-of-pocket payments limiting the affordability for low-income population (relevance).
- Not all procurements were needs-based, e.g. equipment for operations for a hospital specialised in Traditional Chinese Medicine (TCM). This reduced the project's efficiency.
- Most of the equipment supplied under the project was in good condition at the time of the evaluation and was being used intensively. Maintenance contracts for major equipment that had expired after the FC project ended were extended, which is an indication of good sustainability.

Conclusions

– Since the beginning of the COVID pandemic, the demand for many other health care services in particular for preventive health care dropped - a trend that can be seen in many countries. Due to this distorting effect, data from 2019 was used for the evaluation.

– Maintenance costs for major equipment for their entire life cycle should be reflected in project planning.

– As long as basic health care is inadequate, patient movements between healthcare levels unregulated and hospitals chronically underfinanced, integrated regional investment planning– including different healthcare levels – is recommended.

Evaluation according to DAC criteria

Overall rating: 3

Ratings:

Relevance	3
Coherence	3
Effectiveness	2
Efficiency	3
Impact	2
Sustainability	2

Relevance

The economic development of the People's Republic of China has had a positive impact on poverty alleviation and has led to a general improvement in living conditions. At the same time, it also led to significant inequalities in income, healthcare and the health situation between the regions and between the urban and rural population. The outdated healthcare system was no longer able to cope with the increasing demand for healthcare services. In addition, the burden of disease changed with an increase in non-communicable diseases. Market economy reforms resulted in a crisis in the social protection systems. For lower income groups, the affordability of healthcare declined. These developments required comprehensive national reforms of healthcare and financing, including the establishment of a health insurance system, as well as the further development of diagnostic and treatment capacities, especially in disadvantaged provinces.

The FC project is located in rural provinces in the north (Heilongjiang) and west (Sichuan) of China. Compared to other Chinese provinces, the Human Development Index (HDI) there is lower (HDI Sichuan: 0.686 (2012), 0.734 (2019); Heilongjiang: 0.709 (2012), 0.737 (2019), compared to economically strong provinces like Shanghai 0.824 (2012) 0.873 (2019) but also China as a whole: 0.761 (2019)).

The figure below shows the regional discrepancy in terms of the availability of healthcare facilities using the proxy indicator of hospital beds per 1,000 inhabitants and the geographical distribution of beds. The map on the right shows that the hospital bed density in the western and northern provinces, including the project provinces, is significantly lower than in the economically more developed southeast. There, the hospitals are concentrated in few urban centres, resulting in greater distance to the next hospital for those living in rural areas.

Figure 1: Distribution of hospital beds at province level in China[1] (see marking for project provinces)[2]

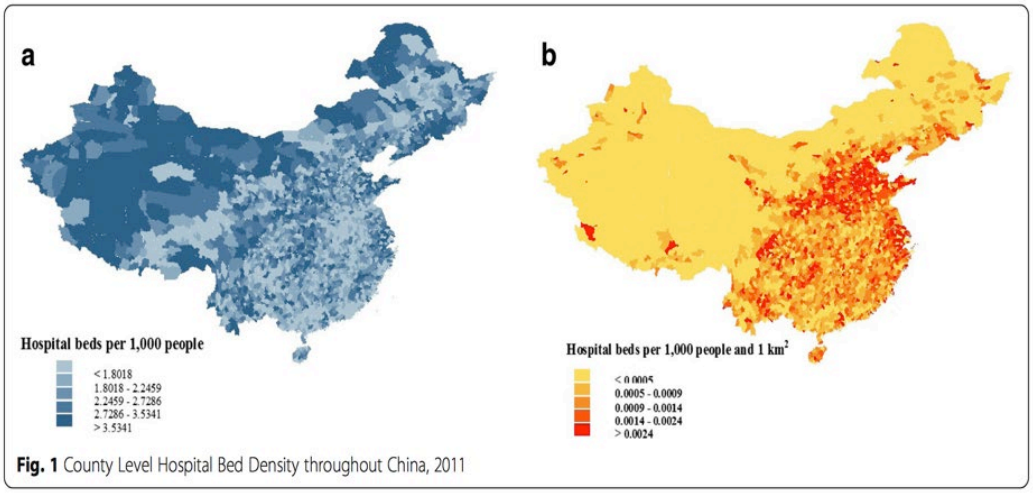


Fig. 1 County Level Hospital Bed Density throughout China, 2011

Prior to the implementation of the FC project, the three selected district hospitals were not capable of providing key diagnose and treatment services, e.g. for lung diseases (black lung, lung cancer), but also in cardiology, neurosurgery and vascular surgery. This was due to damaged infrastructure (due to earthquakes and the effects of coal mining in the region[3]) as well as insufficient infrastructure and equipment.

The target group comprised of around 6.4 million people (2012) living in the area covered by the hospitals in the disadvantaged, rural project provinces. More specific targeting did not take place.

Already at the time of the project appraisal, around 87% of the Chinese population had a health insurance. At the time of the ex-post evaluation (EPE), the WHO[4] estimated a health insurance coverage rate of about 95% of the population. However, the insurance provided for the rural population ("New Cooperative Medical Scheme") only covers basic healthcare, and it can be assumed that healthcare services making use of equipment financed under this FC project will incur additional out-of-pocket payments limiting the affordability for low-income population. A study published in June 2021[5] confirms that the expansion of the health insurance system has contributed to reducing catastrophic health expenditures, but at the same time, low-income sections of the population continue to lag significantly behind higher-income groups, e.g. concerning the use of inpatient health services.

From an ex post perspective, the selection of the project regions seems plausible. The inadequate diagnostic, treatment and preventive capacity for the changing burden of disease in China's northern and western provinces, were correctly identified as a significant part of the key problem at the time of the project appraisal. With an integrated view on healthcare in the project provinces, however, the plausibility of exclusively supporting at district hospital level is limited, given the low performance and attractiveness of primary care and lower hospital levels and the lack of a functioning referral system. The concept of the project further does not seem appropriate to ensure equal access of the target group, as financial barriers

[1] Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5100192/pdf/12939_2016_Article_467.pdf

[2] While the map on the left (a) only shows the number of beds per 1,000 people in the individual provinces (the darker shading indicates more beds), the map on the right (b) provides information on the geographical distribution of these hospital beds per square kilometre, e.g. as a proxy for the distance to the nearest hospital. However, considering only the number of beds per inhabitant on the map on the left paints a different picture. Bed availability per capita there appears better in the less densely populated northern and western provinces than in the southeast.

[3] The soot and emissions from coal mining in Qitaihe have created a toxic layer of dust on buildings in the city centre, causing permanent damage. As a result, the city core was rebuilt in a different location, including the two programme hospitals.

[4] Source: WHO, 2021: Universal health coverage China

[5] Study by Center for Disease Control and Prevention from several provinces in cooperation with Stanford University, source: https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065(21)00083-3/fulltext

to access, especially for low-income sections of the population, have been insufficiently taken into account.

Another aspect limiting relevance of the project is that population growth in Qitaihe declined after the project appraisal. This was not predictable based on the development of the population figures, but changes could have been expected as a result of the decision to close the coal mines in the region with many migrant workers.

The project's theory of change is mostly plausible. The extension and, rehabilitation of existing facilities and new construction combined with the provision of relevant non-medical equipment and the procurement and installation of modern, high-quality medical equipment were intended to improve the quantity and quality of the diagnostic and treatment capacities of the project hospitals. As a result, access for the population in the catchment area should be improved and the use of healthcare services increased, and thus the project aimed at contributing to an improved health situation in the project provinces.

It should be noted that the general conditions for healthcare projects in China are characterized by strict planning and guidance from the Ministry of Finance and that neither joint integrated planning nor dialogue on the healthcare system, e.g. on financing in the sector, are envisaged. Taking into account the mentioned constraints, the relevance is rated as below expectations with "moderately successful".

Relevance rating: 3

Coherence

The FC project was aligned with the Chinese government's priorities in the healthcare sector at the time and continues to be in line with them today. Far-reaching reform efforts from 2009 were primarily aimed at providing universal basic health care for the entire Chinese population by 2020. In this context, systematic measures to improve healthcare for the population of rural regions were planned. Seven other FC projects in the sector, equally implemented in China's northern and western provinces, were also aimed at expanding health infrastructure and fighting HIV/AIDS. These were carried out independently of one another, but complemented each other in their contribution to the priority action areas (see also FCE, 2018: EPE China: modernizing healthcare in the western provinces). The FC project was consistent with the healthcare policy objectives of the Federal Ministry for Economic Cooperation and Development (BMZ).

The project was planned and implemented in close coordination with the respective government agencies. Tenders were organized through the established Chinese structures.

Given the lack of an overarching donor coordination structure, there has been no multilateral coordination in the sector since 2010, including for this FC project. The 2018 EPE concluded that insufficient coordination between national actors but also with the different donors in the sector was a major obstacle to implementing reforms and that, unlike e.g. other donors like the World Bank and FCDO (or previously DFID), German DC did not contribute to the sector reform process.

Due to the limitations in terms of coordination with other donors, coherence is assessed as only "moderately successful".

Coherence rating: 3

Effectiveness

There were considerable challenges for evaluating the effectiveness of the FC project. Indicators related to the use of equipment or services alone are not sufficient for assessing the effectiveness of the project. The informative value of these indicators is limited a.o. given the non-functional reference system and the incentive of an intense use of equipment to increase hospital revenues. Data on use would need to be supplemented with indicators on diagnosis-related quality of healthcare services as well as equity of healthcare and access. However, this kind of data has not been made available for the evaluation. At the time of the appraisal, defined target values were lacking and detailed monitoring data at hospital level was only available to a limited extent.

2020 was overshadowed by the COVID-19 pandemic with restrictions and lockdowns. The data collected shows that the population sought fewer check-ups and other preventive health services during this

uncertain period - a trend that was evident in many countries. Due to these distorted effects, data from the previous year (2019) rather than from 2020 is used to assess and analyze target achievement.

The objective of the FC project (outcome) was to increase the use of the healthcare services, improved in terms of quantity and quality, in three district hospitals in the provinces of Heilongjiang (Mianyang District) and Sichuan (Qitaihe District) through improved diagnostic, treatment and preventive capacities. The hospitals in Qitaihe specialise in mother-child health (Q-MK) and traditional Chinese medicine (Q-TCM); the hospital in Mianyang specialises mainly in cardiovascular and tumour diseases (M).

Indicator	Status PA (2012)	Ex post evaluation (2019)
(1) Increase in annual outpatient treatments	Q-MK: 93,715 Q-TCM: 43,810 M: 499,749	Q-MK: 150,386 à achieved (+60%) Q-TCM: 139,268 à achieved (+218%) M: 790,193 à achieved (+58%)
(2) Increase in annual inpatient treatments	Q-MK: 6,303 Q-TCM: 4,284 M: 23,435	Q-MK: 6,806 à achieved (+8%) Q-TCM: 10,360 à achieved (+142%) M: 50,264 à achieved (+114%)
(3) Increase the number of major surgical procedures by at least 40%.	Q-MKH: 657 (2014) Q-TCM: 10 M: 2,283	Q-MK: 1,735 à achieved (+165%) Q-TCM: 41 à achieved (+410%) M: 10,302 à achieved (+351%)
(4) Increase in the number of diagnostic procedures (x-ray, CAT scan)	Q-MK: 7,833 Q-TCM: 16,485 M: 56,902	Q-MK: 20,846 à achieved (+166%) Q_TCM: 39,707 à achieved (+490%) M: 131,275 à achieved (+131%)

All indicators used for the EPE were fulfilled or in some cases even clearly exceeded by the three hospitals. All supported hospitals significantly increased their outpatient and inpatient treatment, with the hospital in Qitaihe, which specializes in TCM, reporting the strongest relative increase in patients, while the number of inpatients at the hospital specialized in maternal and child health increased only slightly (+8%). The sharp increase in outpatient treatment is consistent with the national trend, and was only possible due to expanded capacities.

The number of diagnostic procedures and major surgical interventions increased significantly, which indicates good target achievement. Thanks to investments made under the FC project, the hospital for women and children in Qitaihe, could be expanded to include new departments for MRI, mammography and radiology. The FC project thus directly contributed to achieving the indicator for increasing diagnostic procedures by 166%. For the hospital specializing in TCM, despite the indicator's positive development, it must be noted that the absolute numbers of major interventions are very low compared to other hospitals. Surgery is not carried out at the TCM centre.

Even though no indicators on the quality of healthcare were defined and it was not possible to collect them afterwards, it is plausible to assume that high-quality equipment improved the quality of care through the increased diagnostic and therapeutic capacity. The modernization of the technical equipment of the hospitals to meet state-of-the-art standards is considered positive.

Taking into account their limited informative value, we rate the effectiveness based on the available indicators as "successful".

Effectiveness rating: 2

Efficiency

Implementation was delayed from a planned period of 24 months to 72 months, with 90% of all activities implemented within 36 months. Delays occurred in drawing up the procurement lists and tender documents as well as in starting operations of the radiotherapy building of the hospital in Mianyang, which was implemented as part of the counterpart contribution. The delays did not result in any cost increases. The adjustments made to the procurement lists during implementation resulted in additional costs. These were covered by an increase in the counterpart contribution.

The implementation structure of the project included all relevant stakeholders. Tendering through experienced “window companies” (Chinese tender agencies) combined with advisory support from an international implementation consultant increased efficiency. The investment costs are considered reasonable and are comparable to similar investments in China. The costs for the advisory services appear to be relatively low. The partners took the initiative and assumed a lot of responsibility in the implementation.

For the hospital in Qitaihe, which specialises in TCM, procurement was not sufficiently needs-based, which was due to the requirement to meet government standards and specifications for hospitals at certain reference levels. For example, the operating costs for the surgery department (including sterile maintenance of the operating rooms, regular training) are relatively high in view of an average of only one operation per week.

The allocation efficiency of the FC project can only be evaluated to a limited extent. The inadequate care at lower levels of the Chinese healthcare system, the non-functioning referral system and the lack of a gate-keeper function, combined with inadequate hospital financing, lead to systemic inefficiencies (see also under Relevance). In terms of allocation efficiency, integrative planning that includes all levels of care would be beneficial. The exclusive focus on hospital level should be scrutinized from an efficiency perspective. During the planning period, however, there were clear preferences and requirements from the Chinese partners for investments in hospital care (see also under Relevance).

From the EPE perspective, all in all, the selection of the provinces seems to have been reasonable. However, in the case of the two hospitals in Qitaihe, which are located close to one another, there could have been better regional planning and coordination concerning the range of investments.

The EPE confirms that most of the equipment supplied under the FC project is well functioning and used intensively. Staffing was assessed as adequate at the EPE. All hospitals have improved their responsiveness[6] and reputation.

Operations are profitable in two of the three hospitals. The third hospital, which specializes in mother and child health, has been able to greatly reduce its deficit since the appraisal. It is plausible that the FC measures contributed positively to the ratio between income and expenditures at all three hospitals. Even in 2020, although treatment and patient numbers declined due to the unusual situation caused by the COVID-19 pandemic, the hospitals delivered satisfactory financial results.

By introducing or expanding the diagnostic, treatment and preventive services of the project hospitals, patient care closer to home was improved, lowering opportunity costs for the patients.

Due to the limitations in production efficiency, especially in Qitaihe, and limitations in the ability to evaluate allocation efficiency, the overall efficiency is rated as only "moderately successful".

Efficiency rating: 3

Impact

The objective at impact level was to make a contribution to improving the health situation of the population living in the poorer, more rural northern and western provinces of China. To evaluate the developmental impact, the maternal mortality and infant mortality indicators were used as proxy indicators in the EPE, even though they do not enable any conclusions to be drawn about the contribution of the individual hospitals. Continuous improvement can be seen both at national level and in the project provinces. The gap

[6] WHO concept to determine to what extent healthcare system and facilities take into account aspects such as dignity, confidentiality, free selection of healthcare facility, timely treatment, etc.

between urban and rural areas has narrowed significantly in recent years (see Figures 2 and 3 below). The differences were completely eliminated for maternal mortality. The disparities in infant and child mortality have narrowed considerably. This is also true for China as a whole beyond the project provinces.

Figure 2: Comparison of maternal mortality trends in urban and rural areas[7]

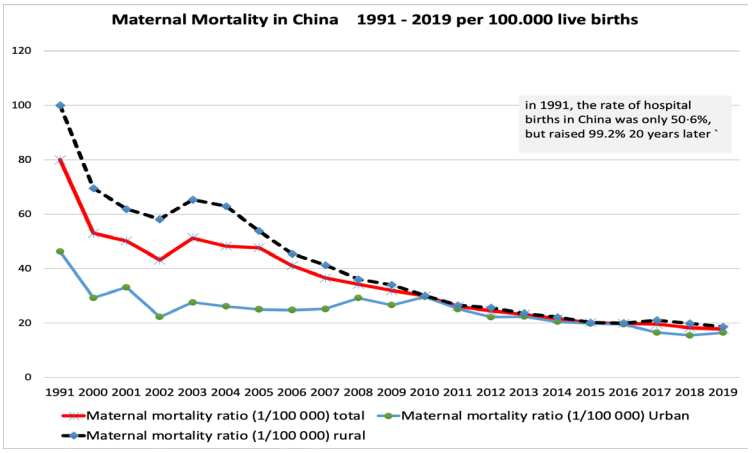
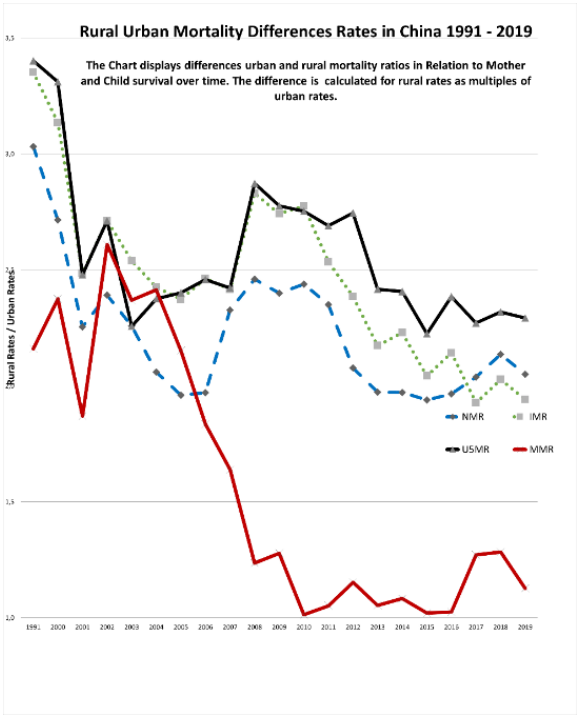


Figure 3: Difference in maternal and child mortality in rural regions compared to cities[8]



No unwanted impacts were found. Radiation protection regulations to protect patients and medical staff were complied with. The disposal of medical waste in the project hospitals also seems to be appropriate for ensuring adequate infection control and reducing negative environmental impacts. The hospitals are regularly inspected by environmental authorities. No negative environmental impacts have been found in recent years.

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[7] Source: Author's diagram based on the National Bureau of Statistics, 2020: China Statistical Yearbook

[8] Source: Author's diagram based on the National Bureau of Statistics, 2020: China Statistical Yearbook;
Key: NMR: neonatal mortality rate; IMR: infant mortality rate; U5MR: under 5 mortality rate; MMR: maternal mortality rate

It is plausible to assume that the project has contributed to improving health in the project area, although this is limited given the relatively small financial scope, so Impact is rated as "successful".

Impact rating: 2

Sustainability

For more information on the positive effects on the financial viability of the project hospitals, see also Efficiency. The government makes up for any shortfalls since the project hospitals are public institutions. This means that operation is currently guaranteed.

In the health sector, the government is continuously increasing the budget to achieve the aim of universal coverage at the national and provincial levels. Despite growing allocations through public funds and health insurance benefits, however, the real costs for patients are also increasing. The ongoing integration of the insurance systems is beginning to show success in reducing the poverty caused by catastrophic health expenditures in the poorer sections of the population.

The maintenance systems appear to be effective and adequately funded. Maintenance contracts are in place for all larger equipment; for smaller equipment, the maintenance is the responsibility of the hospital's in-house technicians. It can be assumed that the long-term use of the equipment is guaranteed. In some cases, the costs for large equipment (including maintenance, consumables, spare parts and disposal) were not taken into account for the entire life cycle in the planning process. Still, the hospitals have concluded follow-up maintenance contracts with their own funds.

Parallel to the implementation of the FC project, the first positive effects of government reforms are visible a.o. through a reduction of the surcharge on the sale of medicines, the adjustment of the fee schedules and the reform of the remuneration and management structures of health care facilities.

The level of sustainability is therefore rated as "successfull".

Sustainability rating: 2

Notes on the methods used to evaluate project success (project rating)

Projects are evaluated on a six-point scale, the criteria being **relevance, coherence, effectiveness, efficiency, overarching developmental impact** and **sustainability**. The ratings are also used to arrive at a **final assessment** of a project's overall developmental efficacy. The scale is as follows:

Level 1	Very good result that clearly exceeds expectations
Level 2	Good result, fully in line with expectations and without any significant shortcomings
Level 3	Satisfactory result – project falls short of expectations but the positive results dominate
Level 4	Unsatisfactory result – significantly below expectations, with negative results dominating despite discernible positive results
Level 5	Clearly inadequate result – despite some positive partial results, the negative results clearly dominate
Level 6	The project has no impact or the situation has actually deteriorated

Rating levels 1-3 denote a positive assessment or successful project while rating levels 4-6 denote a negative assessment.

The **overall rating** on the six-point scale is compiled from a weighting of all five 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).