

**Final Evaluation Report on ORBIS project of
“Establishing an ORBIS Eye Health Network for Poor and
Migrant Children in Shanghai”**

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Background information

Some 30% of Shanghai’s 18.9 million citizens (2008) are migrants. Children aged 17 years and younger account for 10.5% of the total population, and 600,000 of these are migrant children without medical insurance. According to a pediatric eye health survey conducted by Shanghai Eye Diseases Prevention & Treatment Center in 2009, 35% of school-aged children in Shanghai had visual acuity $\leq 6/9$, indicating over 660,000 children with visual impairment. Migrant children and those dwelling in the city’s poorer districts are without access to affordable, high-quality eye care. Uncorrected refractive error accounts for over 90% of visual disability among children in urban China. It has been demonstrated that in many areas half of secondary school children require glasses, and yet some two-thirds of these either do not have or wear them, or have spectacles of such poor quality that they do not improve the vision adequately. Failure to provide children with a simple pair of accurate glasses can inhibit their ability to function well in the classroom. Though strabismus (squint) and amblyopia (lazy eye) typically do not cause bilateral blindness, they are very common among Chinese children, in part because of high rates of uncorrected refractive error. These conditions, which are typically not covered by Chinese health insurance, often go untreated, and may be associated with significant social stigma and reduced future work opportunities. Although an eye disease prevention network exists in Shanghai, pediatric eye services are rarely available at the district or community level, where they are most critically needed for early detection and referral. The high price of medical treatment in Shanghai makes eye care service unaffordable for migrant families lacking health insurance coverage, and for poor patients native to the city.

Project Goal: To improve the sight and change the lives of poor and migrant children living in ten underserved districts of Shanghai.

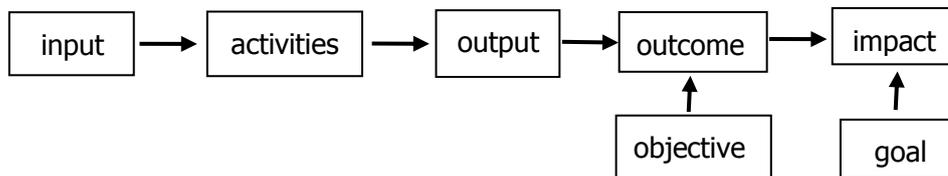
Project Objectives:

1. Establish a school-based vision screening network in 10 poor districts of Shanghai in collaboration with district hospitals in each area.
2. Build capacity to deliver outstanding refractive services and high-quality, inexpensive glasses at the 10 district hospitals.
3. Create and implement an ORBIS data management system integrating data from schools at 10 district hospitals, to track which children detected with poor vision have and have not received follow-up care.
4. Create and prove the effectiveness of an ORBIS educational intervention aimed at parents, teachers and children with poor vision in the 10 districts, and designed to improve acceptance of glasses, refraction and vision services.
5. Improve capacity for world-class care and training in pediatric eye care at Shanghai EENT Hospital, especially in the area of complex strabismus surgery, pediatric cataract and pediatric low vision.
6. Work with Shanghai EENT and local Neonatal Intensive Care Units (NICUs) to strengthen ROP screening capacity in the city of Shanghai.

Evaluation team

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2. Liu Hu, external consultant, MD in ophthalmology, Phd in pediatric ophthalmology
3. Nancy Shi, project manager of ORBIS International
4. Kate Xie, M&E specialist of ORBIS International

Evaluation log frame and methodology



Evaluation tools

- Reports from main partner and branch partners
- Documents review: program progress reports, project documents, original records
- Interview and group discussion: The head of refractive group of EENT, project coordinator of EENT, people in charge of the project from branch partners, project participants of branch partners, trainers, and trainees, teachers from schools
- Observation: outpatient service and project management process
- Field check: equipment and instruments, screening forms and patient surgical records, etc.

Evaluation was conducted at different levels in the log frame, specifically at input level to evaluate equipment budgeted and purchased, human resource invested. At process level to evaluate planned project activities and how the activities were conducted. At output level to check actually yielded output and to compare with the planned. At outcome level pediatric eye care networking establishment and pediatric eye care service capacity of partners are appraised. At goal level the sustainability of improving the eyesight of poor and migrant children in underserved districts in Shanghai is discussed (Please see detailed questions attached).

During the field visit (Please see attached field visit agenda), we visited the main partner of the project, Shanghai Eye, Ear Nose and Throat Hospital (Shanghai EENT). We went to two branch partners, one is private eye hospital, Shanghai Purui Eye Hospital, another one is eye department of Kongjiang hospital and eye disease

prevention institute of Yangpu district, which is with public nature. We also paid a visit to a primary school of Pudong district where eye condition screening and eye care education are conducted.

Table1 Findings on project output objectives

Output objectives	Targets	Actual	Performance rate in %
1. Establish a school-based vision screening network in 10 poor districts of Shanghai collaboration with district hospitals in each area.			
1.1 Two medical staff from Shanghai EENT Hospital will be trained in school-based vision screening for three days at Zhongshan Ophthalmic Center	2	3	150%
1.2 Doctors from Shanghai EENT Hospital will train 2 doctors and 2 nurses from each of 10 district hospitals, as well as 25 Shanghai EENT medical staff in school based vision screening.	65	65	100%
1.3 Doctors from district hospitals train 2 teachers and school nurses at each school in the 10 districts in measuring children's vision accurately (Assume 35 schools per district)	1000	1446	144.6%
1.4 Teachers and nurses carry out annual vision screening for children at each school in the 10 Districts. These screenings are timed to coincide with health screenings at the schools. (Assume 35 schools per district, 500 children per school).	400000	408488	102%
1.5 District doctors, assisted by nurses will refract children with uncorrected VA \leq 6/12 in either eye at schools and promote them (assume 30% of children need refraction, based on previous ORBIS programs and published surveys in urban China)	132000	311316	235.8%
1.6 District hospitals provide a choice of attractive free spectacles at the school for poor, non-resident children who do not receive the free glasses benefit given to Shanghai residents. Free glasses are also provided for all teachers participating in the screening	For children 4200	5555	132.3%
	For teachers 840	659	78.5%
1.7 Spot quality checks on teacher vision screening performed at each school by doctors from District Hospitals (35 schools in each of 10 Districts, each school audited once over the life of	450	440	97.8%

the project)			
2. Build capacity to deliver outstanding refractive services and high-quality, inexpensive and attractive glasses at the 10 District Hospitals.			
2.1 Provide equipment for refraction to 10 district hospitals	10 sets	10sets	100%
2.2 Annual spot quality checks on refraction performed by Shanghai EENT at the 10 District Hospitals	32 visits	20 visits	62.5%
2.3 Spot quality checks on glasses wear among children given free glasses performed by doctors at District Hospitals (10% random sample of schools in each district); promoting spectacle wear among children needing glasses)	42 schools	111 schools	264.3%
3 Create an ORBIS data management system at the 10 district hospitals to track which children detected with poor vision have and have not received follow-up care.			
3.1 Provide data management systems to 10 district hospitals		Not available	0%
4. Create, implement and prove the effectiveness of an ORBIS educational intervention aimed at parents, teachers and children with poor vision in the 10 districts, and designed to improve acceptance of glasses, refraction and vision services.			
4.1 Create educational intervention for children with poor vision due to refractive error to their teachers and parents and promote spectacle wear at parent meetings.	350 schools	350 schools	100%
4.2 Questionnaire survey on spectacle wear among children owning glasses before and after the intervention (10% random sample of schools)	43 schools	111 schools	258%
5. Improve capacity for world-class care and training in pediatric eye care at Shanghai EENT Hospital, especially in the area of the area of complex strabismus surgery, pediatric cataract and pediatric low vision			

5.1 One 6-month international fellowship in complex strabismus and two 3-month international fellowship in complex strabismus and low vision for doctors from Shanghai EENT Hospital	5	4	80%
5.2 HBP in complex strabismus and pediatric cataract by ORBIS visiting fellows at Shanghai EENT Hospital	2	2	100%
5.3 Shanghai EENT will provide training to train 1 ophthalmologist, 1 nurse and 1 orthoptist from each of 10 district hospitals	30	30	100%
5.4 Simple horizontal strabismus cases at 10 district hospitals (assume 50 cases of total increase per year)	3600	3562	98.9%
5.5 Complex strabismus cases at EENT (assume increase over life of project by 40% over current number of 1000)	1400	1999	142.8%
5.6 Pediatric cataract cases at Shanghai EENT (assume increase over life of project by 30% over current number of 170)	850	790	92.9%
6. Work with Shanghai EENT and local Neonatal Intensive Care Units (NICUs) to establish an ROP screening network for the city of Shanghai.			
6.1 Three-month international fellowship in diagnosis and laser treatment of ROP for 1 doctor from Shanghai EENT Hospital	1	1	100%
6.2 Hospital-based programs for doctors at Shanghai EENT in ROP screening and treatment	1	1	100%
6.3 Children diagnosed and treated with ROP (Assumes 10% need treatment)	180	99	55%

6.4 Parental education on need for ROP screening and follow-up through “health prescription” by hospitals	5000	4125	82.5%
6.5 Establish and equip a Low Vision Center offering services for children at Shanghai EENT	1	1	100%
6.6 Hold a short-term workshop in pediatric low vision at Shanghai EENT hospital	1	1	100%
6.7 Provide one-day training for 50 medical staff at Shanghai EENT hospital and 5 medical staff from each of 10 district hospitals in recognition and referral of paediatric low vision.	1	1	100%

From table 1 we can see that the project targets have been accomplished quite well in children vision screening network establishment, delivering refractive services and inexpensive and attractive glasses at the 10 District Hospitals, eye care educational interventions, all types of training plans, and improving the capacity of EENT in managing complex pediatric eye conditions and early intervention of ROP. The main partner has worked very hard in selecting branch partners, delivering training to lower level partners, conducting community screening, providing eye care services for the poor, and coordinating project progress among branch partners. The whole staff of refractive group have involved in project activities, even sometimes by taking up their weekend and holiday time. Also they contribute their own allowance to provide more free spectacles to poor children. They explored several channels to look for and help poor and migrant children such as Shanghai Welfare Homes, schools for migrant and minority children. It is impressive of their passion and rigorous attitudes toward project implementation and their

work. Most of the performance have achieved planned target, and some even exceeded the objectives. Only for the target of “Provide data management systems to 10 district hospitals” it is not yet accomplished. The reason is that it is costly to set up a new information collecting system, which is not budgeted enough in the project, and moreover, it is not easy to convince partners who are from different system to accept and use an unanimous system, especially for those who have had an existing information collection system capable of collecting the same set of data points project proposed, meaning it is redundant for partner hospitals to establish an additional one of the same function. And for the target of “Children diagnosed and treated with ROP”, the performance has only reached 55% of the target. In the project plan this target firstly was planned to be completed by EENT, but due to the very little newborn baby EENT has access to, a project modification has been made and the partner of Children’s Hospital joined in the project in September of 2013 who has the access to newborn babies and becomes the main party conducting ROP screening and early treatment. The late involvement of Children’s Hospital causes the delay of the fulfillment of this target.

Name of partners	Screening output	Pediatric outpatient visit		
		Before project	After project	Increased rate
Affiliated EENT Hospital of Fudan University (center)	122330	83500	91900	10%
Affiliated Children's Hospital of Fudan University	0	74700	97200	30%
Affiliated Jinshan Hospital of	46061	35300	48600	38%

Table 2 Findings on screening and pediatric eye care service capacity for each branch center

Fudan University				
Affiliated Huadong Hospital of Fudan University	0	63100	76300	20%
Eye Disease Prevention Institute of Yangpu district	98353	12100	17500	44.6%
Eye Disease Prevention Institute of Jingan district	52878	22500	23500	5%
Central Hospital of Xuhui District	0	25100	27300	9%
Central Hospital of Jiading district	2291	60900	62800	3%
The Second Hospital of Shanghai	2739	9812	12099	23%
Liberation Army 85 hospital	7204	23300	28500	22%
Purui Eye Hospital	64196	21200	32800	55%
Punan Hospital	12436	24100	25200	4.6%

Note: Purui and Punan partners joined in the project since the year of 2014

Community screening is critical to reach those in need of eye care service but not yet have taken. A school-based vision screening network in 10 districts of Shanghai in collaboration with district hospitals in each area has been established. Apart from main center, EENT, 11 branch partners have been in place and functioning in the network. And total target of screening has been accomplished well, from table 2 we still can see that the main contributors are EENT hospital, Affiliated Jinshan Hospital of Fudan University, Eye Disease Prevention Institute of Yangpu district, Eye Disease Prevention Institute of Jingan district and Purui Eye Hospital. For most of the branch partners the biggest obstacle is the difficulty to get access to schools to conduct vision screening due to governmental regulations. By regulation, only limited number of service providers is given permission to conduct screenings at school premises. For some others lacking motivation to develop eye care service is the main reason causing low output of school screening and clinical service. Among the better performers, Purui Eye Hospital is a private natured organization, who has much more motivation

to do quality community outreach by three outreach teams in order to get more market share in eye care market, though facing same difficulty as other partners, they still try hard to mobilize more resources and explore more channels to go into schools, especially the schools out of city. That is the reason why although it joined the project only for one and half years, its performance is the best in school screening, and service provision as well. It is also impressive that the two “Eye Disease Prevention Institutes” in Jingan and Yangpu district achieved well in school screening too. Eye Disease Prevention Institutes is very unique in Shanghai which is under administration of local health bureau and particularly focus on eye care and part of their work is yearly school vision check for children. Most of them are from district CDCs, and these two partners are together in operation with district hospitals (general hospital for Yangpu, and eye hospital for Jingan), which combine primary eye care together with secondary eye care service. Partners from this system are well motivated as well cause the government subsidies funds based on capitation of their school vision check task performance.

From table 2 we can also see that almost all the branch partners have increased their capacity in delivering pediatric eye care service (mainly refraction and strabismus) to different degrees after project capacity building activities. And Yangpu partner we visited, one of the top performers, is able to provide comprehensive adult outpatient and inpatient eye care service, for example the surgical cataract cases can reach to roughly 400 per year. The advantage of professional human resource in adult eye care is very helpful for them to integrate pediatric eye service into existing service.

One more thing in common for the two branch partners with better performance of pediatric service provision is that they both have glass dispensing service (one is Purui the other one is Jinshan partner), which is very important for targeting population who are detected refractive abnormal in screening to comply to receive the follow up refraction service at partner hospital. For branch partners who don't have glass dispensing service can't have more incentives to do school screening than those

who have which can bring economic benefits, and the increase of outpatient visits indicate the same thing. As for Yangpu and Jingan partners who are from same background perform differently in pediatric eye care service capacity from perspective of outpatient visit, from the interview with the director of the hospital of Yangpu partner, the head of eye department, and one senior staff from eye disease prevention institute, we can see that the hospital takes highly of the development of eye department and strongly support project activities, including school screening, clinical treatment, and research in eye care. Through joining the project they have conducted large scale of school screening activities and collected lots of information regarding school children eye care. And the outcome is that the grants were provided by local government based on their school workload, outpatient patients have increased, the income of eye department has increased, and several scientific papers have been published every year. And the director of the hospital is confident to copy the same model to maternity care in the hospital. So the vision and strong support from senior management of partner hospital is another key factor to guarantee better eye care service development.

For Purui partner, on one hand they have several teams working in communities and schools all year round, which ensure sufficient patient source. On the other hand they keep on optimizing service process all the time with the increased patient visits. For example they separate children refractive service from adult, which makes pediatric eye care service with higher efficiency and quality.

Another good performer, Affiliated Children's Hospital of Fudan University, though joined the project late, the eye care service capacity still has been enhanced a lot. This partner hospital is a well known children's hospital in Shanghai with nationwide children patients but eye care capacity is not competitive in Shanghai. Since joining the project they have received training of HBP and international fellowship, the capacity in pediatric eye care has been improved dramatically. Especially improved capacity in dealing with complex eye conditions such as complex strabismus,

congenital eye diseases, ROP and RB has surely benefited the large volume of children patients. Now the surgical cases can reach to more than 500 per year, and ROP screening can reach to 200 cases on monthly basis. During the interview with the trainee, also the head of eye department, expressed that he has learnt a lot from international fellowship and HBP program, and share the knowledge and skills with colleagues. Beyond technical skills, learning of communication skills with children patients, convenient service process, friendly oriented settings are all very helpful for the partner to improve service quality for better.

As one of the top eye care facilities in China, EENT has been in a leading position in providing eye care including pediatric eye care. During this project through HBP and international fellowship program, the trainees updated their knowledge and skills in management of complex strabismus, congenital eye diseases and low vision, and keep on learning and practicing toward world class level service.

Other findings regarding effectiveness and quality issues

1. The targeting population of the project is poor and migrant children in Shanghai. And partners have tried very hard to locate children in welfare homes and schools that mainly accept migrant worker children. But there is no data available to assess the proportion of poor migrant worker children in the children beneficiary of this project. Also a better definition for “poor” and “migrant worker children” is needed.

2. Although the screening network has set up during project, school screenings procedures are not standardized for all the branch partners. From the field visit we know that the purpose of screening can be different from one partner to another. For example for Yangpu Kongjiang partner, to obtain research information is one of the screening purposes, For Purui partner screening means to get back as many patients as possible. So the information collected, screening tools, and screening procedure can be very different. It is still a bit far from the meaning of screening from perspective of public health which is to detect potential patients with easy and operable tools.

Otherwise some patients maybe missed or maybe misdiagnosed, and both can influence the further uptake of service.

3. One of the project objectives is “Teachers and nurses carry out annual vision screening for children at each school in the 10 Districts. ” In reality almost all the screenings are conducted by hospital partners. Training for school teachers and activities to effectively engage and motivate teachers are needed.

4. Although school screening activities are the core of the project, and partners work very hard in doing so, for example, the program coordinators at partner hospitals would randomly select number of patients to check up on glasses-wearing adherence. But more rigorous follow-up activities of children who have received school screening are needed. There is no information on whether the potential patients identified through screening have come back to hospital for further treatment, or whether the diagnosed patients receive treatment such as start wearing glasses, or uptake of any other services, or the reasons for lack of adherence. The lack of follow-up activities will affect the effectiveness of educational intervention to promote glass wear. Moreover, educational interventions are not outstanding in the project. Only eye care information is communicated to teachers, parents and students by flies, brochures and through parent meetings. Desired behavior for children to accept and wear spectacles cannot be guaranteed.

5. Spot quality checks on glasses wearing among children given free glasses performed by doctors at District Hospitals are more subjective by asking several questions about wearing experience but no objective check on glass quality is available.

Recommendations

1. District hospital partner selection consideration:
 - a) Better option involves in primary eye care that is already government authorized (Yangpu partner) to circumvent difficulty of accessing schools;

b) Better option to be hospital that has affiliating optical shops (so the hospital can capitalize on the benefits of screening, i.e. motivate to participate)

c) Better option to be hospitals of the following management style: adaptable to needs of target population that adaption reflects on its outreach/engagement strategy and its quick response to demand, e.g. increase/decrease of service (e.g. Purui parnter); or strong support of senior management on eye care programs(e.g. Yangpu partner)

2. Target population outreach: would be better to have more effective measures and standards to assess the target population, i.e. low SES (social economic status) children; More channels need to be explored such as some social organizations that is working on poor and migrate children, and governmental sectors such as civil administration.

3. Patient follow up measures of outreach, e.g. report on percentage of low SES children in proportion to the whole students body reached/treated, and information system to track whether the targeting population take up or not further service, if not patient management measures should be considered. These tools can also be used to evaluate the cost benefit of community screening and sustainability of eye care service.

4. To standardize network procedure, clarify the information collected, design information collection forms for universal use, develop standardized screening tools and procedure to ensure the validity of screening, and to increase community work efficiency.

5. To ensure educational intervention effectiveness to promote patients with glass wearing, more public health or health information communication professionals, tools and methodology can be considered to increase the compliance of patient behavior. Modern social networkng technology such as wechat can also be used in eye care information sharing and educational activities.

6. Beyond quantity targets, quality control measures should be also considered

to assess service delivered. Specific and measurable indicators and tools should be developed and discussed at project design phase.

7. Sustainability: follow up service e.g. Glass dispensing or ROP treatment has to be in place before actions taken to screen patients, and the cost of the follow up services can be recovered for financial benefit to make sure that even after the project is ended the partners will be motivated enough to continuously provide such service in the long run. It has to be considered at the beginning of project design and partner selection stage.

· **Evaluation field visit agenda**

Date	Time	Activity
Dec 22th		<ul style="list-style-type: none">• Arrival at Shanghai, hotel check-in

Dec 23rd	09:30 – 11:30 12:00-13:30 13:30-17:30	<ul style="list-style-type: none"> • Evaluation at Shanghai EENT hospital • Brief introduction by EENT team: general information of project progress, training measures, project management mechanism, difficulties and challenges, and any other useful information. • Project documents review (<i>Equipment maintenance, training material and plan records, etc.</i>) • Stakeholders and beneficiaries interview <ul style="list-style-type: none"> - <i>Project manager</i> - <i>Doctor trainers, nurse trainers</i> - <i>HBP trainees</i>
Dec 24th	8:00-17:00	<ul style="list-style-type: none"> • Evaluation at branch centers <ul style="list-style-type: none"> - one branch center in the morning, if possible to visit a ROP screening and intervention service on the way to or back from the branch center. - one branch center in the afternoon, if possible to visit a school where school teachers perform well in school vision check and spectacle wearing education on the way to or back from the branch center. • Brief introduction by the branch center (pediatric eye care service capacity change before and after project, including community, outpatient and inpatient service volume, project and hospital investment, eye care service revenue, training effect, if possible, quality assurance and patient management measures can be introduced, difficulties and challenges, and any other useful information) • Service process observation and purchased equipment review • Project documents review (<i>Equipment maintenance, screening and surgery records, etc.</i>) • Stakeholders and beneficiaries interview <ul style="list-style-type: none"> - <i>Hospital leader, Director of Ophthalmic Dept.</i> - <i>Doctor trainees, nurse trainees</i> - <i>Patients/school teachers if possible</i>
Dec 25th	9:30-12:00	<ul style="list-style-type: none"> • Evaluation conclusion meeting with EENT management • Evaluation result report

Dec 25th		<ul style="list-style-type: none">• Departure from Shanghai