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Focus on childhood blindness – Rethinking prevention and treatment

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Summary

- In the past, international health policy and German development cooperation have placed particular emphasis on preventive measures. There are good medical reasons for this, as demonstrated by the systematic control of infectious diseases through vaccinations or the provision of vitamin A to prevent corneal blindness (primary prevention).
- However, with the increase in preventive strategies, curative health care has taken a back seat. This is detrimental to a balanced global health policy, as there are diseases with major social implications that cannot be prevented, or cannot be prevented sufficiently, but require curative care.
- The example of childhood blindness caused by cataracts or glaucoma shows that prevention and treatment should be better balanced and interlinked in future global health policy. This also applies to German development cooperation with partners in Africa, where greater attention should be paid to efficient curative medicine. Children with clouded lenses in both eyes (cataracts) are blind but can be almost completely integrated into society through surgical intervention at the earliest possible stage. The same applies to most children with elevated intraocular pressure (glaucoma) before birth, if they are identified in time and treated surgically.
- The treatment of childhood blindness is a suitable example for the realignment of German development cooperation and global health policy with the aim of achieving an equilibrium between preventive and curative measures, as it clearly illustrates the medical, social, moral and economic added value of the desired intertwining of prevention and cure. A health economic simulation underlying this discussion paper showed that cataract surgery is cost-effective compared to non-treatment.
- Institutionalised partnerships are a key instrument for better integrating prevention and cure. The Rostock-Kinshasa (Democratic Re-

public of Congo) and Tübingen-Blantyre (Malawi) partnerships presented as examples in this discussion paper are long-standing health projects of German development cooperation. Both examples show that such initiatives enable *people to help themselves*: they contribute to the establishment of screening structures, the improvement of medical care and the postgraduate training of ophthalmologists at the local level.

- Bureaucratic hurdles and, in some cases, insufficient political support remain challenges for such structures. However, the examples show that, with relatively little effort, successful cooperation with the target countries on an equal footing and geared towards sustainability is possible. Such cooperation can provide impressive impetus for the expansion of a balanced and more equitable health policy in the target countries by supporting the development of the necessary infrastructure and the postgraduate training of specialist personnel.

Against this background, three interrelated courses of action are recommended:

(1) A **strategic realignment** of global health policy and German development policy with the aim of achieving a more balanced weighting and stronger interlinking of prevention and cure. This aspect should be taken into account in the continuation of the *Federal Government's global health strategy*.

(2) **The Federal Republic of Germany's operational focus** on education and support for institutionalised partnerships in development cooperation with the aim of providing sustainable *help for self-help*. Within the framework of bilaterally institutionalised partnerships, initiatives to strengthen curative care in the target countries should be promoted. Such partnerships can be initiated at the national level and implemented by care providers with practical experience. Germany's increased commitment to establishing curative care structures in the target countries is an important complement to the WHO's efforts to invest in global prevention programmes such as pandemic prevention.

(3) In order to strengthen curative care in global health care, the Federal Government should provide a **framework programme for state funding** that includes various measures that can be combined flexibly and in line with needs:

1. Support for institutionalised partnerships geared towards sustainability (*help for self-help*). These projects should be accompanied and evaluated on a scientific basis.
2. Provision of the necessary infrastructure, such as medical equipment or treatment instruments, required for implementation.
3. Support for the professional training and further education of local medical professionals, for example through temporary postgraduate training and fellowship programmes.
4. Political support for institutionalised partnerships through bilateral talks and negotiations at national level in order to reduce political and administrative obstacles to the establishment of these partnerships and their day-to-day work.

1 Introduction

Over the past 20 years, *global health* has become established as a term for international activities aimed at improving global health through a wide range of measures. In its *Global Health Strategy* published in 2020, the German government commits to this approach, which, according to the current definition, integrates public health and individual clinical care.[1] However, international health policy and German development policy largely follow an approach that prioritises disease control measures and relegates general access to healthcare (primary and secondary care) to the background.

The concept of *Universal Health Coverage* (UHC), which has now been taken up by the United Nations and enshrined as a principle in the *Sustainable Development Goals* (SDGs), aims to overcome this one-sidedness. However, particularly in German development cooperation, the concept had been narrowed down too much to financial risks ("universal social protection in case of illness"[2]), so that the need for acceptable quality and broad health care in countries without comprehensive health systems has been largely ignored. This discussion paper addresses this issue by advocating the consistent implementation of an integrative approach that treats the principles of prevention and cure as equally important and is referred to here as *Global Clinical Care*.[3] This refers to all measures that improve clinical care and treatment worldwide and make medical innovations available, especially in regions with

1 Koplan et al. 2009. While prevention refers to the prevention of disease and measures to promote health, cure refers to the care of individuals in the event of illness (clinical care). The goal of curative treatment in the narrower sense is the restoration of health (Pschyrembel 2025, keyword: cure, https://www.pschyrembel.de/Kuration/S01FU/doc/). The distinction made in this paper between prevention and cure should therefore be understood as ideal-typical. On the German government's global health strategy: German government 2020.

2 GIZ n.d.

3 This approach is in line with the WHO's view of the human right to health, which, in addition to the non-medical determinants of health, also calls for access to healthcare.

previously limited access to healthcare. However, it is crucial to respect and take into account cultural priorities and preferences at all social levels.[4]

The example of childhood blindness will be used below to show that healthcare improves when preventive and curative measures go hand in hand: for example, comprehensive prevention with measles vaccines and vitamin A supplements has significantly reduced blindness as a result of corneal damage in children worldwide. However, other causes of childhood blindness, such as cataracts and glaucoma, can only be treated through surgery and thus curative intervention. Effective combating of childhood blindness therefore requires both prevention and cure.

This correlation also corresponds to the interpretation of *emergency and essential surgical care*, which has long been neglected internationally and has been the subject of a global initiative by the *World Health Organisation* (WHO) since 2005.[5] The cost-effectiveness of the measures addressed there has long been scientifically proven, especially in the case of eye health operations.[6] Cataract operations are even highlighted as procedures in which technical innovations greatly facilitate their performance and in which the otherwise controversial short-term deployment of specialised international surgical teams is helpful.[7] Of the 11 percent of the global disease burden that can be treated surgically, 5 percent were cataracts in 2008 – almost as many as operable pregnancy complications.[8] The WHO's *World Health Assembly* explicitly lists cataract surgery in its 2015 resolution *Strengthening Emergency and Essential Surgical Care and Anaesthesia as a Component of Universal Health Coverage*.[9] And the third edition of *Disease Control Priorities*, commissioned by the World Bank and the world's most important

4 See the internationally binding interpretation of human rights in Comment No. 14 on the human right to health, which calls for culture to be respected at all social levels so that the norms of the majority society are not imposed on minorities and individuals. It cannot therefore be a question of simply taking into account the cultural preferences of an entire region, which may discriminate against individual groups and individuals.

5 WHO n.d.

6 Javitt 1993.

7 Farmer & Kim 2008.

8 Ozgediz et al. 2008.

9 WHA68.15.

publication on cost-effectiveness in healthcare, also lists cataract surgery and eyelid surgery for trachoma among the procedures covered by *essential surgical care*.[10] Eye diseases such as childhood blindness are therefore a central focus of *Global Clinical Care* and, at the same time, an impressive example of the need to anchor the curative principle more firmly in international health promotion in the future.

The authors of this discussion paper therefore examine the question of how the concept of *Global Clinical Care* can be strengthened in concrete terms, both in international health policy and in German development cooperation. The focus of their considerations is on the instrument of institutionalised partnership, which refers to long-term formats for bilateral cooperation between healthcare providers. The starting point for their analysis was the practical expertise of some of the authors, who have been working for decades in ophthalmic care and in the training of ophthalmic professionals in parts of Africa, for example in the Democratic Republic of Congo and Malawi. Their empirical knowledge has been incorporated into the assessment and conclusions of the discussion paper and underpins its claim to feasibility, effectiveness and efficiency.

The argumentation in this discussion paper is based on normative goals that are not scientific but social or political in nature:

- Investments in global health have a value that goes beyond the subjective effects of individual health, namely the well-being of individuals. Compassion, security, justice and solidarity are fundamental values of most societies and, as such, are also the goals of public health policy on a global scale. Normative This understanding is reflected in the *Universal Health Coverage* (UHC) and the *Sustainable Development Goals* (SDGs) of the United Nations.
- Fundamentally, every society must weigh up for itself the importance it attaches to public health. The organisation and implementation of public health care depend largely on the availability of socio-economic resources and on political decisions. Countries generally make health policy decisions based on available resources. In countries with fewer resources, the scope for action is often severely

10 Debas et al. 2015.

limited and external actors play an important role in healthcare provision. In view of scarce resources, global health policy and German development cooperation should therefore focus on cost-effective measures.

- *Partner orientation* and equal cooperation are central principles of global health policy and German development cooperation.

The normative goals listed here are well-founded both ethically and politically. However, the interpretations and value judgements that arise from them are always the subject of social and political debate.

2 Global health financing between prevention and cure

In the past, international health policy and German development co-operation have focused their support on preventive measures. This strategy can be justified by the principle of subsidiarity and also shapes public health care in many countries: while individuals and their families are willing to pay high costs for medical treatment in their own emergencies, the financing of supra-individual measures can only be achieved through public funds. For this reason, states regard public health as their fundamental responsibility, also as part of protecting public safety.[11] The so-called donor countries in the international development and health policy system also give preference to population-based measures that serve, for example, to combat infectious diseases and prevent pandemics, and these are significantly more "popular" than, for example, a commitment to establishing clinic partnerships, which are often perceived as small-scale.

The strategic concept that continues to shape global health policy in the manner described above is known as the *Primary Health Care* (PHC) approach and was introduced by the WHO in the 1980s. This strategic orientation resulted in development policy prioritising preventive measures and their financing. At the time, efforts focused on combating causes of illness and death associated with unclean water, poor nutrition, lack of vaccinations and inadequate hygiene knowledge.[12] As a health approach oriented towards society as a whole, PHC aims to ensure the highest possible level of health and well-being and its equitable distribution among the population. It should focus on people's needs and requirements and meet them as early as possible across the broad spectrum of healthcare – i.e. through prevention and prophylaxis rather

11 Promoting healthcare is fundamentally the responsibility and sovereign right of every state.

12 This is exemplified by the fight against maternal mortality, which in the Democratic Republic of Congo was estimated at 547 deaths per 100,000 births in 2020 (CIA 2025).

than through curative treatment, rehabilitation or palliative measures.[13] The PHC approach follows the principle of combating disease as effectively and efficiently as possible.

However, the PHC approach also gave rise to the widespread prejudice that prevention is cheaper than curative treatment for every disease.[14] This widespread assumption needs to be revised from a health economics perspective, bearing in mind that

1. many cases of illness that can be successfully treated at relatively low cost cannot be effectively prevented by preventive measures;
2. life-saving interventions must also be considered in the PHC approach;
3. health risk detection strategies, which are part of prevention, only make medical sense if appropriate curative and rehabilitative services are available (for example, meaningful early risk detection during pregnancy also requires treatment options, such as caesarean section);
4. the credibility of preventive messages from the health system is enhanced not least by the fact that this health system can demonstrate visible successes in the curative field.

When these four criteria are applied, the view of the relationship between preventive and curative successes in individual areas shifts significantly.

Beyond this very fundamental broadening of perspective, a conceptual distinction must also be made between primary prevention and secondary prevention. There is ample evidence in the research literature that primary prevention of diseases can actually be more efficient than their curative treatment. This applies, for example, to attempts to prevent certain infectious diseases through vaccination (e.g. measles),[15]

13 WHO/UNICEF 2018, p. VIII.

14 The *Selective Primary Health Care* (SPHC) approach adopted by UNICEF and the World Bank, i.e. the targeted, selective development of basic medical care for a few selected diseases, was based on the assumption that targeted, i.e. limited, interventions are more cost-effective than the development of broad health infrastructures. Based on this approach, UNICEF's *GOBI-FFF* programme, launched in the 1980s, has successfully contributed to reducing child mortality with simple means.

15 WHO & IAPB 2000, p. 1.

prophylaxis[16] or lifestyle changes (e.g. dietary changes and promotion of physical activity in the case of cardiovascular diseases)[17].

Secondary prevention, on the other hand, focuses on the early detection of diseases before they become clinically relevant or less treatable. Screening programmes can only ever be a precursor to curative treatment if the results are positive; at the same time, they are of fundamental importance for its success, as the example of childhood blindness shows: the earlier cataracts or glaucoma are treated, the greater the foreseeable success of the therapy. Early treatment not only improves patients' immediate quality of life, but also enables them to participate in society, increases their educational opportunities and contributes to greater productivity (see Chapter 3.3). If, on the other hand, a child undergoes cataract surgery at a very late stage, they may not be able to learn to read or attend regular school later on, despite treatment.

Prevention and cure are therefore to be regarded as two links in a comprehensive medical care chain in terms of the *Global Clinical Care* concept. How the two strategies are to be integrated in practice is always the subject of a complex overall assessment based on the principles of effectiveness and efficiency. This is because every intervention (e.g. an operation) must be effective, i.e. it must achieve its objectives (e.g. improving quality of life). At the same time, however, every intervention must also be efficient, as the resources used for it are then unavailable elsewhere. This aspect is of central importance in the view of increasing resource constraints in international health projects. For example, the withdrawal of the *United States Agency for International Development* (USAID), the *President's Emergency Plan for AIDS Relief* (PEPFAR), and the reduction of US contributions to the WHO are contributing to this development. As a result, many donor countries feel compelled to prioritise their measures even more strongly.

16 Splieth & Fleßa 2008.

17 Schwappach et al. 2007.

3 Example of childhood blindness: clinical pictures, data situation, simulation calculation

Although blindness is not the most common disease among children and adolescents, there are very good reasons to examine it more closely within the framework of the *Global Clinical Care* approach. The successful fight against childhood blindness is an excellent example of the necessity of both prevention and cure. The almost complete elimination of corneal blindness worldwide is a major success for preventive health measures. New cases now only occur in regions with very low standards of living that are not yet accessible to prophylactic measures.[18]

However, effective reduction of childhood blindness due to other conditions requires curative intervention, as demonstrated by the most common cause of blindness in Africa today – cataracts – which can only be treated surgically. A simulation calculation using figures from the Democratic Republic of Congo showed that surgical interventions to combat cataracts are both efficient and effective from a health economics perspective (see Chapter 3.3). First, however, it is necessary to examine the key clinical pictures of cataracts and glaucoma, as well as the data available on childhood blindness, in order to illustrate the need for an integrated health strategy. This is followed by two examples of institutionalised partnerships to combat childhood blindness, which illustrate the medical, social and economic added value of *Global Clinical Care*.

18 The sharp decline in corneal scarring in Africa is largely due to the almost universal substitution of vitamin A in deficient areas and the consistent implementation of measles vaccination. The remaining cases almost exclusively require corneal transplants. Given the complexity of the treatment strategy, it is recommended that only children who are blind in both eyes be included in the corneal transplant programme. The donor tissue required for this can only be obtained locally in exceptional cases; the material provided by US corneal banks is expensive and is only used in individual cases.

3.1 Childhood blindness in sub-Saharan Africa

The most common causes of childhood blindness in sub-Saharan Africa are bilateral cataracts, congenital glaucoma, retinopathy of prematurity[19] and retinoblastoma[20]. The following description is limited to cataracts and glaucoma, as both conditions can be reliably treated using standardised methods and, in almost all cases, patients can subsequently lead independent and self-determined lives – thus fulfilling the criterion of effectiveness. Although follow-up procedures are more frequently necessary in the case of glaucoma, the treatment measures can still be considered highly effective.

3.1.1 Cataract

The term "cataract" refers to a clouding of the lens of the eye. It usually occurs in older people and generally leads to complete blindness. Around 20 million patients worldwide are affected. Cataracts are therefore the most common cause of blindness worldwide.[21]

All forms of cataracts have one thing in common: they can only be treated surgically and are therefore curable. In adults, the procedure almost always leads to complete and immediate restoration of vision, even if visual function has been severely impaired for a long time (months to years). In this respect, the situation differs fundamentally from that of a child with congenital or early childhood cataracts. The difference lies in the fact that normal early childhood development of vision requires a sharp image of the environment on the centre of the retina. Only then can the appropriate connections between the nerve cells in the brain develop to ensure high-quality vision. However, it is precisely this sharp retinal image that is missing in an eye with cataracts during the crucial phase of infancy and early childhood. It is therefore essential to take all possible measures to compensate for the incom-

19 Retinopathy of prematurity (ROP) is a developmental disorder of the retina that often leads to blindness if left untreated.

20 Retinoblastoma is a malignant disease of certain retinal cells that, if left untreated, can lead to both blindness and death.

21 In rarer cases, cataracts occur in childhood and are sometimes already present at birth. The causes of cataracts in foetuses and infants are still largely unknown. It is suspected that illnesses in the mother during pregnancy and genetic changes play a role.

plete development of the neural network and thus reduce amblyopia (lazy eye) as much as possible. One way to achieve this is through optimal optical correction (implanted lens with additional spectacle correction), which is why spectacles are required immediately after surgery. Several years of follow-up care, at least until the child starts school, is also important to ensure the long-term effectiveness of the treatment.

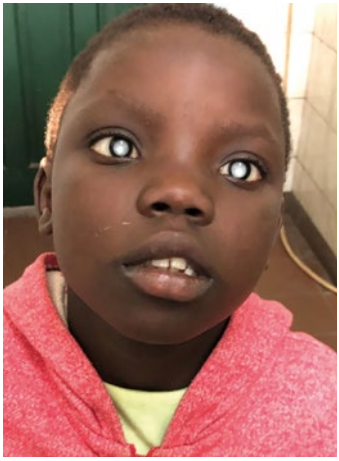

Figure 1: Seven-year-old boy with dense congenital cataracts, who was recently found by community workers during targeted search activities and referred for treatment. (source: Deutsches Komitee zur Verhütung von Blindheit, DKVB)

3.1.2 Glaucoma

Glaucoma is a progressive chronic disease leading to retinal ganglion cell death and blindness.

Due to its prevalence, it is also referred to as a widespread disease: glaucoma is one of the most common causes of irreversible blindness globally; approximately 60 million people worldwide are affected – with incidence rising due to demographic developments. The disease usually occurs from the age of 40 onwards. The main risk factor is increased intraocular pressure, which can be treated effectively with the right resources and timely screening. If intraocular pressure is reduced sufficiently, the progression of the disease can be significantly slowed down. However, due to inadequate treatment and usually late diagnosis, up

to 40 percent of affected patients still lose vision in one eye in low- and middle-income settings.[22]

In the congenital form of glaucoma, the increased intraocular pressure affects the developing eye even before birth. This leads to overstretching of the still unstable walls of the eyeball, including the cornea. This is associated with a massive enlargement of the affected eye. By the time of birth, considerable damage may already have occurred, necessitating surgical treatment in the newborn or infant stage. In low-income countries, the necessary surgery can only be performed in highly specialised centres. If adequate care is not available, bilateral blindness and anatomical changes, as shown in Figures 2 and 3, are almost inevitable.

Figure 2: Six-year-old girl with congenital bilateral glaucoma. Both eyes are already irreversibly blind and significantly enlarged. Due to the continued elevated eye pressure and the inability to close the eyelids completely, painful corneal ulcers have formed that are difficult to treat. In the medium term, it is likely that the eyeballs will need to be removed. In the sub-Saharan region, artificial eyes are not usually provided to conceal the loss of organs. (source: Deutsches Komitee zur Verhütung von Blindheit, DKVB)

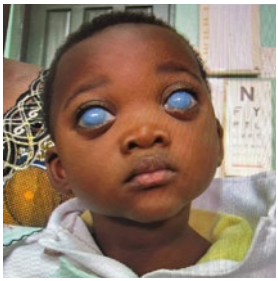

Figure 3: One-year-old girl with congenital glaucoma and significantly enlarged eyes at initial presentation. (source: Deutsches Komitee zur Verhütung von Blindheit, DKVB)

22 Glaucoma is less common in childhood; in some cases, it is already present at birth. The incidence is reported to be approximately 1 in 10,000 births, with the disease sometimes being inherited in an autosomal recessive or dominant manner. However, it usually occurs sporadically, so that a purely genetic cause cannot generally be assumed.

3.2 Data on childhood blindness

The data collected worldwide on childhood blindness is based on different criteria, which limits its comparability and leads to an overall incomplete data basis. The *Lancet Global Health Commission on Global Eye Health* – a renowned international panel of experts – has also pointed out the significant lack of epidemiological data.[23] Information on case numbers is often based on regional and time-limited surveys, questionnaires or existing medical data, but also on school statistics, estimates and projections. Due to this heterogeneity and differences in quality, the available data sets are associated with considerable uncertainty.[24] In addition, measuring the visual acuity of young children is difficult and hardly standardised, which sometimes makes reliable diagnoses difficult. Given these limitations, the figures published by the *Vision Loss Expert Group, Global Burden of Disease* (VLEG-GBD Group)[25] should be regarded as estimates. Nevertheless, the wealth of data allows an approximation of the actual number of cases and thus enables at least a basic epidemiological assessment.[26]

Against this backdrop, the following data on the prevalence[27] and incidence[28] of childhood blindness is available: According to the latest estimates, the number of blind children worldwide is between 1 million and 1.5 million, which corresponds to an average global prevalence of approximately 4.8 per 10,000 children. The prevalence is significantly higher in most parts of Africa (West Sub-Saharan: 7.8 per 10,000 children, East Sub-Saharan: 6.1 per 10,000 children, Central Sub-Saharan: 8.6 per 10,000 children). Globally, an estimated 19 million children under the age of 15 are visually impaired (1 percent of the total global age group). Of these, 1.4 million are irreversibly blind (0.08 percent of

23 Burton et al. 2021.

24 Data from development cooperation partner countries are associated with particularly high levels of uncertainty. They often come from schools for the blind, which are only attended by about 10 percent of children, mostly from privileged circles. The number of unreported cases is likely to be much higher (Gilbert & Foster 2001).

25 Burton et al. 2021.

26 Ibid.

27 Prevalence refers to the number of cases of disease in relation to a specific population.

28 Incidence refers to the number of new cases of disease per year in relation to a specific population.

the total global age group)[29], three quarters of whom live in low- or middle-income countries;[30] and up to 60 percent of them die within a year of losing their sight.[31] Almost a quarter of the world's blind children live in Africa.[32]

According to WHO figures, glaucoma accounts for 2 to 6 percent of childhood blindness.[33] Corneal blindness accounted for 50 to 70 percent of childhood blindness in poorer countries;[34] however, this proportion has been significantly reduced through extensive WHO prevention programmes. Furthermore, retinoblastoma is cited as a cause of blindness in children, with 1 case per 15,000 to 20,000 births.[35] In low- and middle-income countries, there is a period of more than 6 months between the first clinical signs of retinoblastoma and diagnosis, and the mortality rate among those affected is 70 percent.[36]

Figure 4 shows the correlation between a country's socioeconomic development and the prevalence of childhood blindness, and further differentiates the correlation according to individual clinical pictures. It shows that childhood blindness is about ten times more common in poor countries (6,000 per 10 million inhabitants) than in rich countries (500 per 10 million inhabitants).

29 Elsman et al. 2019.
30 WHO & IAPB 2000.
31 Ibid.; Kong et al. 2012.
32 Gilbert 2007.
33 WHO & IAPB 2000.
34 WHO 1992.
35 Dimaras et al. 2012.
36 Ibid.

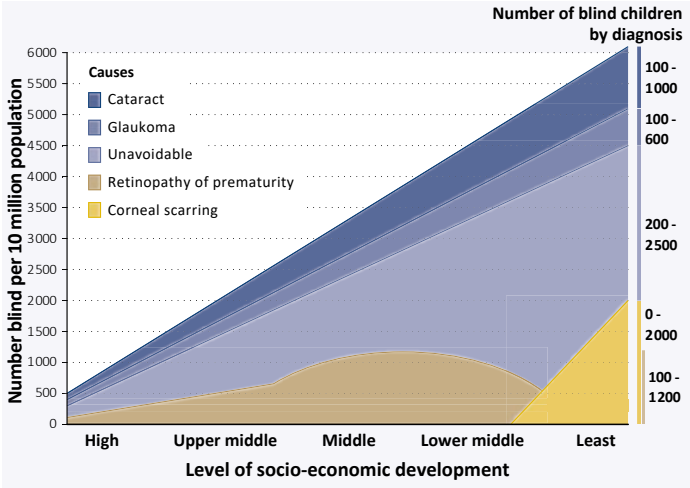

Figure 4: Correlation between a country's socioeconomic status and the prevalence of childhood blindness, colour-coded according to clinical picture, data from 2012 (source: own representation based on The Lancet 2021).

The following findings can be gleaned from Figure 4:

- Blindness caused by bilateral **cataracts** is about ten times more prevalent in the poorest regions of the world than in the richest regions. **Congenital glaucoma** cannot always be successfully treated, even in socioeconomically developed countries, meaning that some children go blind despite all measures taken. In contrast, the prevalence of blindness is about six times higher in less developed countries.
- In the case of **retinopathy of prematurity**, the situation is more complex: in richer countries, the significantly lower incidence of blindness is largely determined by the quality of ophthalmological care, which places the highest demands on technical equipment and the experience of surgical staff. The costs of such requirements can no longer be financed below a certain level of socio-economic development, and the rate of blindness rises disproportionately until, in extremely low- n income situations, postnatal care is so minimal that only a few premature babies survive at all.

- **Corneal blindness** is in sharp decline thanks to successful vitamin A supplementation and trachoma prophylaxis, and new cases occur almost exclusively in the poorest regions of the world.
- The proportion of childhood blindness that is **unavoidable** under local circumstances is highest in all regions of the world. A detailed analysis of the causes is not part of these considerations.

As there is better data available on cataracts than on the other causes mentioned above, the frequency of bilateral cataracts will be discussed in more detail here:

The prevalence of cataracts in children is reported to be 1 to 15 cases per 10,000 children.[37] According to estimates, 200,000 children worldwide are currently blind due to cataracts.[38] Every year, 20,000 to 40,000 children are born with congenital cataracts.[39]

Various reports show that lens abnormalities were responsible for 15.5 percent of blindness in schoolchildren in West Africa, 7.4 percent in southern India and 9.2 percent in Chile. Similar studies conducted in Malawi, Kenya and Uganda also found that blindness in 13.1 percent, 9.1 percent and 27.6 percent of children, respectively, was due to unoperated cataracts.[40] In Ethiopia, 9.2 percent of blindness in schools for the blind was due to unoperated cataracts.[41] Finally, in Kinshasa, the capital of the Democratic Republic of Congo, a study conducted in schools for the blind found that cataracts were the main cause of blindness among the children examined there; of 139 blind children, 47 suffered from previously undiagnosed bilateral cataracts (33.7 percent).[42]

37 Foster et al. 1997.

38 Sheeladevi et al. 2016; Foster et al. 1997.

39 Sheeladevi et al. 2016; Foster et al. 1997.

40 Sheeladevi et al. 2016.

41 Ibid.

42 Ngoy et al. 2020b.

3.3 Health economic scenarios using the example of cataracts

At this point, the question arises as to whether, for health economic reasons, the treatment of cataracts in children through the creation of curative health structures could be a promising approach that is more cost-effective in the long term than non-treatment. Therefore, corresponding calculations and scenarios are derived for the example of cataracts based on a case study from the Democratic Republic of Congo (DR Congo). It can be shown that an intervention in children that leads to an increase in lifelong productivity is highly likely to be beneficial for the country in question and should be carried out as long as its effectiveness is sufficiently high and proven.

Every medical institution and every health policy programme must be evaluated in terms of effectiveness and technical efficiency according to health economic principles.[43] The same applies to the entire supply chain, whose effectiveness must be analysed as much as its allocative efficiency.[44] Finally, a health economic analysis must take into account the overall societal impact of a specific intervention, which often cannot be measured in financial terms. In any case, a serious health economic assessment cannot be reduced to a single indicator (e.g. euros per life year gained).

Curative care must therefore also be analysed from the perspective of effectiveness and efficiency. The first question to ask is whether, and under what conditions, curative care generates maximum benefit for the patient, whether the same result could be achieved with fewer resources, or whether a different approach could generate greater benefit from the resources available. Furthermore, it must be asked whether a curative intervention as part of the care chain receives the correct allocation or whether upstream care services should have been better equipped to avoid more costly curative interventions. In addition, how-

43 Technical efficiency describes whether a service is provided in the best possible way in an institution (e.g. hospital) or a programme (e.g. health education), i.e. whether everything is done correctly.

44 Allocative efficiency asks whether the right thing is being done at all, or whether more could have been achieved by using resources differently. For example, the question is often asked whether prevention or cure would be more efficient. This is a question of allocative efficiency.

ever, it must also be examined whether a particular disease should be treated at all. Such a view may take into account the death of people, but it does so with a utilitarian focus, so that a shift of resources to the fight against other diseases would only be considered if it saves significantly more lives. Finally, it must also be asked whether reliable treatment, especially for vulnerable groups, does represent an added value for society and whether the reliability and safety of treatment are of great importance for the fabric of society as a whole. In particular, ethnological and socio-ethical aspects must be considered here.

A valid overall health economic assessment of curative intervention for paediatric cataracts is complex and requires more data than is currently available. Nevertheless, a sample calculation can be used to illustrate some basic relationships.

3.3.1 Simulation

For the explanatory calculation, the costs and benefits of surgery for children with cataracts in Kinshasa were simulated. The data sources were a literature analysis,[45] an internal final report on the Elikya project in Kinshasa (surgery on 600 children with cataracts) and a standardised survey of experts from an ongoing project in Kinshasa (*EKHA.22* project) led by Rostock University Medical Centre.[46] In addition, WHO statistics on demographics[47] and the quality of life of people with and without visual impairments, as well as the gross domestic product (GDP) of the DR Congo, were included.[48] Table 2 in the appendix shows the corresponding parameters with their minimum, modal and maximum values, where relevant.

The model calculates the present value[49] of direct (e.g. treatment costs) and indirect (e.g. loss of economic productivity) lifetime costs, as well as lifetime benefits (e.g. quality of life) with and without inter-

45 Wilson, et al. 2011; Ngoy, et al. 2020.

46 See Chapter 4.1: Case Study 1.

47 World Health Organisation 2025.

48 Lindfield, et al. 2012; World Bank 2025.

49 The present value is the value that future values have in the present. This usually refers to future monetary values, but future benefits can also be converted to present values.

vention. Table 1 in the appendix lists the model parameters.[50] The data used here refer to children with congenital cataracts who have no other diseases or disabilities. For example, children who were also born with hearing impairments were not included because a comparison between those who underwent surgery and those who did not is not meaningful.

The following aspects were taken into account when determining the parameters in Table 2.

1. **Success of the intervention:** 56 percent of the children who underwent surgery in the Elikya project were subsequently able to attend a normal school, while 44 percent attended a special school for children with visual impairments. In a similar project in Nepal, 62 percent of the children examined there were still blind at the time of presentation; after cataract surgery, only 5.6 percent were still blind, while 54 percent of the children who underwent surgery were found to have normal vision. Given these findings, it seems reasonable to assume that 50 percent of children will have average economic productivity after surgery without further measures, and that the other 50 percent will also achieve average productivity with more intensive support measures. Data from the *EKHA.22* project in Kinshasa show that 35.4 percent of the operations performed there were unsuccessful, meaning that the children were still blind or had severe visual impairments. However, 87 percent of those who underwent surgery were enrolled in school as normal. It should therefore be assumed that the minimum gross domestic product per capita with intervention between the ages of 19 and 65 is 40% of the average GDP per capita.
2. **Life expectancy:** Life expectancy at birth in the DR Congo was 63.7 years in 2019.[51] The life expectancy of children who have undergone successful cataract surgery is no different from that of children who were born healthy. The *EKHA.22* project showed that only 2.9 percent of children who underwent successful surgery died in the year following the operation, which does not represent a significant

50 Where possible, ranges (minimum, modal, maximum) were collected and used for the sensitivity analysis. For example, for the intervention year, it was determined when children can undergo surgery at the earliest, at what age children most frequently undergo surgery, and up to what age surgery is possible at all.

51 World Health Organisation 2025.

excess mortality rate. Blind children, on the other hand, have a significantly lower life expectancy because they are often neglected. It is assumed that the excess mortality rate in the first five years after the possible operation is 50 percent. If they survive this period, no significant excess mortality is to be expected. This results in a life expectancy of 45 years for blind children who do not undergo surgery and a life expectancy of 60 years for children who do undergo surgery.

3. **Quality of life:** Individual quality of life depends on the degree of visual impairment. The present simulation assumes an average quality of life without visual impairment with a value of 0.900, while that of a blind person is 0.662 and that of a person with severe visual impairment is 0.686.[52]
4. **Gross domestic product per capita:** The per capita gross domestic product (PPP, current international dollars)[53] in the DR Congo was 1,670 international dollars in 2024.[54] Fifty-one percent of the population is classified as the productive population in the 15 to 64 age group; this means that the average gross domestic product per productive worker is 3,275 international dollars. Blind people, on the other hand, have very low productivity, with an estimated value of 100 international dollars per capita per year.
5. Children and older people produce little or no social product. Instead, children require educational investments of 250 international dollars per year (estimated). Fifty percent of children who undergo surgery also require an additional investment of 50 percent in order to lead a normally productive life (estimate). This results in average investment costs of 375 international dollars for curative intervention.
6. Finally, it can be assumed that the schooling of blind children is more expensive than that of children with normal vision, as the disability requires more intensive care. Neglect without schooling is taken into account in one scenario, but does not appear to be ethically justifiable.

52 Lindfield, et al. 2012; World Health Organisation 2025.

53 PPP: Purchasing Power Parity (adjusted for purchasing power).

54 World Bank 2025.

In this example based on data from Kinshasa, the difference between the present values of the costs and contributions to the national product is US$ 23,409.37, and the difference between the present values of quality of life is 5.4. This means that cataract surgery is cost-saving and at the same time improves quality of life; in other words, it is an ideal case in which curative intervention for the benefit of children's health is profitable in every case. Table 3 in the appendix shows the results of this base scenario in the first row. The other rows should be interpreted as showing the respective gains in gross domestic product and quality of life for the parameter constellations from Table 2 with their respective minimum and maximum values, in order to estimate the effect of data uncertainty. The other parameters are each set at the median. The last two rows of Table 3 show the values for the worst and best scenarios; that is, all parameters are varied within the limits defined in Table 2 so that they assume the optimal and worst constellations.

The scenarios clearly show that curative intervention is practically always cost-saving; that is, within the estimated range of the variables, early surgery for children with cataracts would also be financially profitable.[55]

However, if the surgery only leads to a slight improvement in vision, the conclusion is different. Firstly, it would be expected that the quality of life would only improve slightly. As explained in the *WHO* report *WHO Methods and Data Sources for global Burden of Disease Estimates 2000–2021*[56], determining reliable quality of life values for visual impairments is difficult and controversial. However, the WHO assumes (rounded) a reduction in quality of life due to blindness[57] and severe or moderate visual impairment of 0.338, 0.314 and 0.089 respectively.

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55 Only in the worst-case scenario would the present value of the gain in social product be negative (-2,286.83), which would still result in a gain of 1.8 quality-adjusted life years, meaning that the cost per QoL would be 1,294.44 US dollars, which is below the gross domestic product per capita threshold for strong cost-effectiveness.

56 World Health Organisation 2025.

57 All statistics and definitions from World Health Organisation 2025. Distance vision blindness "is completely blind, which causes great difficulty in some daily activities, worry and anxiety, and great difficulty going outside the home without assistance." Distance vision, severe impairment "has severe vision loss, which causes difficulty in daily activities, some emotional impact (for example worry), and some difficulty going outside the home without assistance". Distance vision, moderate impairment: "has vision problems that make it difficult to recognise faces or objects across a room".

Consequently, if surgery for cataract-related childhood blindness only results in severely impaired vision, the quality of life improves to only 0.686. In this case, neither an increase in life expectancy nor normal schooling can be expected. Under such conditions, the surgery would no longer be cost-saving. The productivity (measured in terms of social product) of an operated-on child must be at least 2.4 times higher per year of life as an adult than the corresponding value for a blind, unoperated child in order for the intervention to still be cost-saving.

3.3.2 Generalisation

Based on this case study, the following generalisation can be made with some reservations:

- Curative intervention in children that leads to an increase in lifelong productivity makes economic sense for the economy in question and should be carried out as long as its effectiveness is sufficiently high and proven.
- The discount rate[58] as a measure of time preference is highly relevant. If costs and benefits are assumed to be equal at all points in time (r = 0 percent), the monetary advantage and the increase in quality of life as a result of the curative intervention increase. If, on the other hand, a higher rate is assumed, the present value of the monetary variables may no longer be cost-saving, and the quality of life benefit shrinks. This means that a systematic focus on the future is of great importance for the decision to intervene.
- Productivity during working years is crucial for assessing the benefits of curative intervention. If the treated children go on to achieve average lifetime productivity, the intervention tends to be cost-saving. However, if the intervention results in a lifelong disability (e.g. visual impairment), their productivity could be significantly lower in countries with high unemployment, and efficiency could therefore decline. The quality of medical and nursing care is therefore particularly important.

58 Discounting is the tool used to calculate the present value and refers to the discounting to the present.

- If the curative intervention does not significantly improve quality of life, this implies a lower present value difference and thus tends to reduce the economic benefits of the curative intervention.
- Curative interventions are particularly efficient when they are integrated as closely as possible into existing health systems and make use of grassroots outreach services. For example, special hospitals should not be built for operations on children with cataracts; instead, the existing hospital infrastructure should be used. Programmes for identifying children with cataracts and providing further care after surgery should be part of existing primary health services (in particular existing prevention programmes and outreach services) in order to ensure equitable and sustainable care. Vertical blindness control programmes, on the other hand, should be avoided.
- The dichotomy between prevention and cure is just as ill-suited to the challenges of the global health sector as the fundamental prioritisation of a single approach. Rather, both dimensions of health care must be integrated. Curative care makes an important contribution to the health and welfare of the world's population, as exemplified by the treatment of childhood blindness. However, the solvency of private households, especially those affected by poverty, is too low to cover the costs of intervention. In the long term, therefore, curative care must be financed primarily through state health systems and/or (social) health insurance, especially in the case of complex interventions. In the case of efficient interventions with a positive net present value, international financing is not only humanitarian aid, but also actual help for self-help.

In summary, it can be concluded that global health policy and German development cooperation should first focus on interventions that enable lifelong improvements in quality of life and productivity. The costs of intervention (including follow-up care) appear reasonable in comparison. The younger a child is at the time of intervention and the higher the quality of the intervention, the more cost-effective it is likely to be.

There are currently no empirical long-term studies on cataract surgery in children on the African continent that would determine the above parameters beyond the case study from Kinshasa. However, based on

the available simulation, it can be assumed that the probability of a cost-saving effect as a result of the intervention is relatively high – especially if the patients concerned subsequently attend a mainstream school and can lead a (nearly) unrestricted life. Even if the intervention costs more over a lifetime than it brings in monetarily, the ratio of the present value of the net costs to the present value of the quality of life benefits is likely to be low, meaning that a relatively small investment yields a significant improvement in quality of life. At the same time, concern for children contributes significantly to strengthening social cohesion and trust.

For regions with extreme resource scarcity, however, it should be noted that not everything that appears economically sensible can be financed from their own resources. Even if those affected were willing to bear the costs, this does not necessarily mean that they are able to do so. Interventions by the health care system quickly lead to so-called *catastrophic expenditure* for households, which exceeds their individual capacity to pay.[59] The establishment of public social systems (e.g. social health insurance, *National Health Service*) is therefore a key prerequisite for the sustainable promotion of child health.[60] Until such a system is established, the relevant *clinical care* should always be supported within the framework of development cooperation if the cost-benefit ratio clearly favours curative intervention but the local financial resources do not (yet) support it.

59 Xu 2003; Eze, et al. 2022.

60 Nyamugira, et al. 2024.

4 Institutionalised partnerships as the key to integrating prevention and cure

Institutionalised partnerships are an effective tool for integrating preventive and curative approaches into global health policy. The Rostock-Kinshasa (DR Congo) and Tübingen-Blantyre (Malawi) partnership formats presented below are long-standing health policy projects in development cooperation. Both case studies show that such integrative initiatives enable *self-help* in the target countries: locally, they contribute to the establishment of preventive screening structures, the improvement of curative care and the postgraduate training of medical specialists. At the same time, the examples illustrate where bureaucratic hurdles and insufficient political support continue to hinder such projects and thereby reduce their impact. This demonstrates the need for improved framework conditions in the future to successfully shape health policy development cooperation in line with the principles of *Global Clinical Care*.

4.1 Case study 1: International partnership for curative treatment in Kinshasa (Democratic Republic of Congo)

The Democratic Republic of Congo is located in Central Africa and is the second largest country on the African continent in terms of area (2.3 million square kilometres) with a total population of around 100 million inhabitants,[61] of whom 15 million live in the capital Kinshasa. Over 200 ethnic groups are native to the country, but 80 percent of the population identify as Bantu. More than 60 percent of the total population also live below the poverty line. The infant mortality rate (under 5 years) is estimated at 90 cases per 1,000 births. Due to the ethnocultural complexity of the population structure, violent conflicts and widespread corruption, centralised political approaches are currently unlikely to succeed in this economically devastated country; locally

61 United Nations 2019.

adapted solutions must therefore be found. The differences in provision between large cities and rural areas remain enormous in terms of the education system and medical services. In many regions of the country, there are still hardly any ophthalmological care structures.

Added value of the institutionalised partnership between Rostock and Kinshasa

For around 25 years, there has been an institutionalised partnership between the *University Eye Clinic in Rostock* and the Eye Clinic at *Hôpital Saint-Joseph* in Kinshasa, which is run by the local archdiocese and thus by the Catholic Church. The cooperation was facilitated and supported by the regional office of *Christoffel Blindenmission* (CBM).[62] An important goal of the project is to identify measures that can be implemented sensibly and efficiently under the conditions of the African megacity of Kinshasa, with its public health system that has so far only been developed in a rudimentary way. In addition, those involved in the project want to strengthen local expertise in the field of paediatric ophthalmology in the long term so that sick children can lead independent and self-determined lives through medium and long-term rehabilitation. By 2026 at the latest, the project should then be run independently by local actors. Since 2015, the format has been financed by third-party funds from the *Else Kröner-Fresenius-Stiftung*. Currently, the biggest challenge facing the format is finding local leaders to make the project independent of external funding in the long term.

62 At the suggestion of *the German Ophthalmological Society* (DOG) and with the support of *Christoffel Blindenmission* (CBM), an exploratory trip was undertaken in 2000 (Cameroon, Gabon, Democratic Republic of Congo) to identify structures that seemed suitable for long-term development cooperation in ophthalmology. The largest eye clinic, run by the Archdiocese of Kinshasa, proved to be the most suitable partner for establishing long-term development cooperation. The main objective was to identify areas of care that were clinically relevant but had not yet been offered in the necessary quality.

Figure 5: Ten-year-old boy after cataract extraction and artificial lens implantation with one pair of "one-dollar glasses" each for distance and close-up vision. (source: Deutsches Komitee zur Verhütung von Blindheit, DKVB)

The Rostock-Kinshasa project is an example of a successfully institutionalised partnership between German and local actors, but also between the public and civil society sectors, including *non-governmental organisations* (NGOs) and churches. Tailoring activities and care to local needs has been and remains crucial to the success of the partnership format. One focus of the project is therefore the establishment of a health infrastructure for identifying blind children, especially those affected by bilateral cataracts. This care structure is supported by the Catholic social welfare organisation *Caritas*.[63]

However, the establishment of a secondary preventive infrastructure in all residential areas of Kinshasa goes hand in hand with the curative care of identified blind children: as part of the project, the affected children receive effective medical care, which includes both surgical interventions and the medical follow-up care required after cataract surgery until they start school. In the course of the Rostock-Kinshasa project to date, it has been possible to integrate the majority of the children receiving medical care into a normal school and to guide approximately 20 percent of the children enrolled here to university education.[64]

63 Caritas has created a system known as Accompagnement des Malades à Domicile (AMD) and Réhabilitation à Base Communautaire (RBC) in Kinshasa.

64 Internal statistics from the local *Réhabilitation à Base Communautaire* from 2024.

Other activities within the framework of the institutionalised partnership are dedicated to the postgraduate training of local specialists. For example, community workers are trained locally to help identify blind children in Kinshasa. In addition, since 2003, three-month *mini-fellowships* have been awarded to doctors from Kinshasa, financed by the *German Ophthalmological Society* (DOG) and the *International Council of Ophthalmology* (ICO). The aim of the programme is to provide specialist medical staff from Kinshasa with modern and effective postgraduate training. To date, the *fellowships* have mainly been used for postgraduate training at the *University Eye Clinic in Rostock*. The *fellows'* repeated short stays in Rostock have created a close relationship of trust between the two sides. Another clear indication of the successful cooperation and collegial atmosphere within the format is that none of the local participants has left the project in the last 20 years.[65] Furthermore, 25 joint publications have appeared in international journals, and doctors from Kinshasa have given around 15 presentations at international conferences.[66] The programme thus makes an evident and sustainable contribution to the professional, scientific and clinical qualifications of local specialists.

Challenges for the institutionalised partnership between Rostock and Kinshasa

The actual demand for ophthalmological care on site significantly exceeds the capacities of the Rostock-Kinshasa project. The catchment area for children treated by the project mainly covers the area surrounding Hôpital Saint-Joseph. Given the number of treatments carried out by the project and the size of the urban area, it can be estimated that the number of untreated bilateral paediatric cataracts in Kinshasa is likely to be in the region of several thousand patients. In Kinshasa, the number of births is around 600,000 per year.[67] The incidence, i.e. the

65 Around 20 Congolese ophthalmologists have already benefited from this continuously evolving concept. This has resulted in the creation of a network that all participants enjoy using in their everyday work.

66 Examples: Ngoy et al. 2020b; Thomas Stahnke et al. 2020; Ngoy et al. 2019; Ngoy et al. 2020a.

67 United Nations 2019.

number of new children blinded by cataracts per year, is therefore between a few hundred and over 1,000, depending on the study used as a basis (100 to 200[68], 150 to 230[69], 490[70], 1,260[71]).

In addition, the project is repeatedly hampered by political and administrative limitations associated with cross-border cooperation. In future, more bilateral agreements are needed to significantly facilitate development cooperation in the field of *Global Clinical Care*. This raises the fundamental question of whether better framework conditions for the instrument of institutionalised partnership can be negotiated via NGOs already active in the field, such as CBM, or via direct agreements between the *Federal Ministry for Economic Cooperation and Development* (BMZ), the *Federal Ministry of Health* (BMG), the *Federal Foreign Office* (AA) or the *Federal Ministry of Research, Technology and Space* (BMFTR) and the relevant ministries in the Democratic Republic of Congo. Such bilateral agreements would facilitate the implementation, maintenance and expansion of the format. Experience to date shows that local public administration can be effectively involved in such a cooperation project and its implementation on the basis of already established, NGO-funded projects. In the specific case of the Rostock-Kinshasa project, the German Embassy's mediation contributed to this. However, there is still a lack of consistent and formalised cooperation as well as legally secure framework conditions that would support cross-border institutionalised partnerships effectively and with minimal bureaucracy.

Ultimately, every successful cooperation project in the spirit of *Global Clinical Care* requires a reliable infrastructure in order to identify existing local structures and align them with the needs of integrated medical care (e.g. locating and treating blind children). Utilising such existing structures is often more sustainable than establishing new ones under foreign sponsorship. This was achieved in the project presented here through cooperation with the CBM country office, which has been negotiating and concluding contracts for the provision of ophthalmological services (performing paediatric eye surgery) since the beginning of

68 Sheeladevi et al. 2016.

69 Yorston 1999.

70 WHO & IAPB 2000.

71 Ngoy et al. 2020b.

the institutionalised partnership in Kinshasa. In this context, it proved useful to rely on a financial incentive system: Ophthalmological services are clearly defined, documented and remunerated according to the effort involved. For the current project, an electronic database has been developed in stages to document service provision and quality and enable scientific analysis. Reliable framework conditions for institutionalised partnerships will be of great importance for the successful continuation of the project from June 2026 onwards.

4.2 Case study 2: International partnership for medical training in Blantyre (Malawi)

Malawi, a country in Southeast Africa with a population of just under 20 million, faces immense economic and social challenges. Despite these difficult conditions, there are positive developments, particularly in education and healthcare. These include the institutionalised partnership between the *University Eye Hospital* in Tübingen and *Kamuzu University of Health Sciences* (KUHES) in Blantyre in the field of ophthalmological training; it is an outstanding example of cooperation-based improvement of medical care in resource-poor regions. The starting point for this cooperation was a serious shortage of ophthalmologists in the country. To counteract this, a four-year training programme for KUHES graduates was launched in 2005 in cooperation with the University Eye Hospital in Tübingen, which organises bilateral specialist ophthalmological training (11 months in Malawi, 1 month in Tübingen). The aim of the project is to establish a high-quality training structure in Malawi through knowledge transfer, which is self-sustaining in the long term and promotes health policy empowerment and medical self-sufficiency. The format was initially financed by the university partnership programme of the G*erman Academic Exchange Service* (DAAD), then by the DAAD medical programme and the *Else Kröner-Fresenius Foundation.* Donations from organisations (*Rotary, Lions, German Committee for the Prevention of Blindness*) as well as from private individuals and companies also contributed to the financing. In the initial phase, the advisory and organisational support provided by CBM was also particularly valuable.

Added value of the institutionalised partnership between Tübingen and Blantyre

The ophthalmology department at KUHES has the appropriate infrastructure to offer high-quality specialist training in general ophthalmology under the direction of Petros Kayange[72] . The teaching, which takes into account locally prevalent diseases, includes theoretical lectures, practical exercises, clinical rotations and surgical training. The training programme comprises a total of twelve examination hours after two and four years, divided into written, oral and practical sections.[73] The ophthalmology curriculum at KUHES is also standardised and aligned with both the medical needs of sub-Saharan countries and international standards (College of Ophthalmology of Eastern Central and Southern Africa, COECSA; Instituto de la Córnea y de Oftalmología, ICOF). Graduates must successfully pass the ICOF and COECSA scholarship examinations to obtain their specialist title.[74] The structured programme ensures the quality of postgraduate training in line with international standards and improves access to high-quality ophthalmic care locally. Local training in Malawi thus prevents a *brain drain*[75] and promotes the sustainable development of ophthalmology in the country.

The Tübingen initiative contributes to reducing the risk of childhood vision loss, although it is not specifically aimed at childhood blindness. However, Malawi continues to face a shortage of eye care professionals, particularly in paediatric ophthalmology. The recommendation of the *VISION 2020 initiative* of the WHO and the *International Agency for the Prevention of Blindness* (IAPB),[76] to establish four ophthalmologist positions per million inhabitants, poses an enormous challenge for the country; as there are currently only 0.85 ophthalmologists per 1 million

72 The facility in Blantyre is supported by lecturers from various COECSA member countries as well as guest lecturers from Europe who teach specific topics in ophthalmology. The examination, which is based on the standards of *the International Council of Ophthalmology Foundation* (ICOF), is an important factor in ensuring the quality of the training programme and recognition of global standards for medical certification.

73 In contrast, a German specialist examination lasts only 30 minutes.

74 Specialist training in ophthalmology and membership in one of the ICOF societies are prerequisites for participation in the ICOF examination.

75 Schulze Schwering & Batumba 2013; Frenk et al. 2010.

76 IAPB n.d.

inhabitants in Malawi – and a single specialist paediatric ophthalmologist for the entire country.[77] These figures show that institutionalised partnerships will continue to be needed in the near future to further advance the development of a functioning ophthalmic care system.

The Tübingen-Blantyre project has already made a significant contribution to strengthening the healthcare system in Malawi and shows that high-quality medical care can be achieved even under difficult conditions. It serves as an example of how internationally recognised medical standards can be established and sustainably secured in a country with inadequate medical care. The path taken here can be followed beyond Malawi and would thus enable long-term improvements in the care of children and adults with eye diseases elsewhere.

Challenges within the framework of the institutionalised partnership

In order to secure long-term ophthalmological care in Malawi, professional university structures and strong involvement of local stakeholders are needed. In cooperation with the country's Ministry of Education and Ministry of Health, the further development of the field – including paediatric ophthalmology – should be promoted. The training programme should qualify ophthalmic staff, *ophthalmic clinical officers* (OCOs), nurses and optometry and orthoptics specialists for their work in integrated local healthcare. By involving local ophthalmologists more closely in the design and implementation of the programme, ophthalmological expertise can be consistently transferred in both directions of the partnership. However, in order to maintain the quality of local training at an international level in the long term, Malawi needs clinic-based research that takes specific clinical pictures into account. The involvement of local political and administrative structures, for example through state training grants for all professions relevant to ophthalmology, is also an important aspect. However, the institutionalised partnership across national borders still lacks political support, so that bureaucratic obstacles

77 Personal communication with Shaffi Yusuf Mdala, Queen Elizabeth Central Hospital Ophthalmology Blantyre, MBBS, MMed (ophth), Msc (PHEC) (London), FCOphth(ECSA), FICO, Honorary lecturer in Ophthalmology at Kamuzu University of Health Sciences, MBBS, MMED(Ophth), FOphth(ECSA), FICO(Hons) and Petros Kayange Kamuzu University of Health Sciences, Blantyre, Malawi.

repeatedly hinder the successful progress of such projects and the joint development of sustainable medical care structures in the target countries. Further challenges include the financing and provision of medical infrastructure (e.g. diagnostic and treatment equipment), the availability of the necessary premises, the design of information services for those affected, and the administrative and accounting management of project activities in the donor countries.

The goal of health policy sustainability of the programme presented here, as well as other institutionalised partnerships, requires concrete political support. In addition, cooperation with local and international organisations is necessary to promote sustainability, quality assurance and internationalisation in the project's orientation. In the long term, responsibility for the project must be transferred to local players. The establishment of standards and structures and continuous evaluation of the programme are crucial to its success. In future, the project will continue to focus on postgraduate training, knowledge transfer, research and scholarships.

Political approaches

Based on the above analysis and the projects presented as examples, the authors recommend the following three courses of action to the Federal Government for the current legislative period with regard to German development cooperation and global health policy. These should be interlinked:

(1) Combining prevention and cure: The German government's commitment to global health policy and German development policy should be **strategically realigned**.

1. In addition to financing global prevention measures (e.g. to combat infectious diseases or prevent pandemics), the Federal Republic of Germany should also increase its involvement in the field of curative health care.
2. As a principle of global health financing, it should be borne in mind that preventive and curative health care are in fact interdependent, must be more closely interlinked strategically and treated as equals. This principle should be taken into account when prioritising German budgetary resources for development cooperation and global health financing.
3. As part of the update of the *Global Health* Strategy, the interconnection between prevention and cure should be reflected upon and differentiated more clearly. In particular, a strategic focus – for example on institutionalised partnerships – should be considered and examined.

(2) Prioritise institutionalised partnerships: The German government should place greater emphasis on institutionalised partnerships in order to strengthen the curative element in global health policy. Institutionalised partnerships offer the opportunity for deeper med-

ical cooperation between two countries; they can be initiated at the national level and implemented at the highly qualified care level, for example through university hospitals. The goals of such partnerships should always be sustainable *help for self-help* and *cooperation on an equal footing*. In this way, institutionalised partnerships make an important contribution to strengthening the curative principle in global health.

(3) Provide a framework programme for government funding: The federal government should set up a framework programme for institutionalised partnerships encompassing a range of measures that can be combined flexibly and in line with needs. The programme should include the following aspects:

1. Establishment and support of institutionalised partnerships geared towards sustainability (*help for self-help*). These projects should be accompanied and evaluated on a scientific basis.
2. Provision of the necessary infrastructure, such as medical equipment or treatment instruments, required for implementation.
3. Support for the professional training and further education of local medical professionals, for example through temporary postgraduate training and fellowship programmes.
4. Political support through bilateral talks and negotiations at national level to reduce political and administrative obstacles to the establishment of these partnerships and their day-to-day work. This could include, for example, issues relating to administrative and accounting procedures.

Appendix: Health economic evaluation

Table 1: Parameter definition of the health economic model

Parameter	Variable	Dimension
Intervention year	Y	years
Life expectancy without intervention (blind)	Ln	years
Life expectancy with intervention (not blind)	LI	years
Intervention costs (consultation, preliminary examinations, surgery, care in the year of surgery)	CI	US
Follow-up costs per year (in year t+1 after surgery in year t)	CN	US
Number of follow-up years	P	years
Quality of life without intervention per year	Qn	QoL[78]
Quality of life with intervention per year	QI	QoL
Gross domestic product per capita with intervention, age 0–18	GKI	US
Gross domestic product per capita with intervention, age 19–65	GAI	US
Gross domestic product per capita with intervention, age > 65	GOI	US
Gross domestic product per capita without intervention, age 0–18	GKn	US
Gross domestic product per capita without intervention, age 19–65	GAn	US
Gross domestic product per capita without intervention, age > 65	GOn	US
Discount rate	R	%

78 QoL (Quality of Life) takes values between 0 (death) and 1 (complete health) and thus quantifies the quality of life.

Table 2: Parameterisation of the health economic model

Parameter	Minimum	Modal	Maximum	Dimension
Intervention year	0.125	1	6	years
Life expectancy without intervention (blind)	5	45	64	years
Life expectancy with intervention (non-blind)	45	64	64	years
Intervention costs (consultation, preliminary examinations, surgery, care in the year of surgery)	711	1,000	1,500	US
Follow-up costs per year (in year t+1 after surgery in year t)	77	250	700	US
Number of follow-up years	2	3	10	years
Quality of life without intervention per year	0.600	0.662	0.686	QoL
Quality of life with intervention per year	0.90	0.900	0.900	QoL
Gross domestic product per capita with intervention, age 0–18	-375	-375	-375	US
Gross domestic product per capita with intervention, age 19–65	1,310	3,275	3,275	US
Gross domestic product per capita with intervention, age > 65	0	0	0	US
Gross domestic product per capita without intervention, age 0–18	-500	-375	-100	US
Gross domestic product per capita without intervention, age 19–65	0	100	50	US
Gross domestic product per capita without intervention, age > 65	0	0	0	US
Discount rate	0	5	10	%

Table 3: Results of the sample calculation (present values)

Parameter	Increase in gross domestic product [US$]	Increase in quality of life [QoL]
Base scenario (for all modal values)	23,409.37	5.4
Intervention year (min. … max.)	23,327.71 … 21,808.691	6.8 … 5.2
Life expectancy without intervention (blind)	24,059.37 … 23,274.86	14.3 … 4.6
Life expectancy with intervention (non-blind)	19,004.32 … 23,409.37	4.2 … 5.4
Intervention costs (consultation, preliminary examinations, surgery, care in the year of surgery)	23,684.61 … 22,933.18	5.4
Follow-up care costs per year (in year t+1 after surgery in year t)	23,880.49 … 22,183.91	5.4
Number of follow-up years	23,625.33 … 22,159.75	5.4
Quality of life without intervention per year	23,409.3	6.5 … 5.0
Quality of life with intervention per year	23,409.3	5.4
Gross domestic product per capita with intervention, age 19–65	7,993.83 … 23,409.37	5
Gross domestic product per capita without intervention, age 0–18	24,818.63 … 20,309.00	5.4
Gross domestic product per capita without intervention, age 19–65	24,059.37 … 20,809.37	5.4
Discount rate	149,375.00 … 4,691.02	27.8 … 2.5
Best scenario	155,310.00	54.9
Worst-case scenario	-2,268.83	1.8

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Note: All links were active at the time of going to press.

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