

Starting the Debate on the Role of Health Economics to Support Child Friendly Health Care in Europe

Andreas Gerber-Grote, MD¹, Simon Lenton, FRCPC^{2,3}, Volker Amelung, PhD^{4,5}, Massimo Pettoello-Mantovani, MD, PhD^{3,6}, and Jochen Ehrich, MD, DCMT^{3,7}

The Council of Europe produced “Child-Friendly Health Care,” which was endorsed by 47 Ministers of Health during the Declaration held in Lisbon 2011.¹ This health care approach stipulates that sustainable development should fulfill the needs of the present generation without endangering the health of future generations. The aim was to create a virtuous cycle to improve children’s health applying the “5 rights” of protection, prevention, provision, promotion, and participation. However, they did not provide an economic model to support the implementation of the recommendations.

Our aim is to outline the contribution of health economics to the realization of child-friendly health care. The application of classic economic adult health care cost models to child health care is technically difficult because child health care is often more complex and less standardized than adult care (eg, pediatricians are not only treating diseases but the whole child and the family). Up to 8000 rare diseases are the main causes for children with long-term conditions, thus making the use of diagnosis-related group (DRG) systems very difficult to implement. Measures such as quality-adjusted life years (QALYs) developed for adults may be insensitive to the needs of children for a number of reasons, including the lack of appropriate measures and long-term studies.

In summary, there appears to be no role for overly dogmatic economic guidelines in child health, but a high degree of innovation and flexibility is required on which stakeholders in society must agree. The economic models for child health care may have to be adjusted according to different age groups, conditions, settings, and countries.

Economic Theory and Its Arsenal of Methods

Health economics is the science that describes the factors that influence the production, allocation, and consumption of health care from the perspectives of cost and value.² It also includes the analysis of financial and nonfinancial incentives that influence patients’ and physicians’ behavior. Economics recognizes that resources are limited and where there is any scarcity, difficult decisions must be made. Opportunity cost is the term given to the next best alternative to the chosen

option—effectively what you were unable to do because of the choice you made.

This enables health economists to undertake comparative analysis of costs and effects of different resource allocation decisions.³ Various types of cost and benefit analyses can provide information on how much a new intervention would cost and the benefits in comparison with alternative options. The result is expressed as an incremental cost-effectiveness ratio that holds the difference of costs in the numerator and the difference of effects in the denominator. Outcome can be measured in natural units such as life years gained, cases of prevented diseases or comorbidities, number and severity of reduced side effects, or increased duration and quality of life. Effects also can be displayed as overall measures such as QALYs or disability-adjusted life years. Incremental cost-effectiveness ratios usually are used for decision making on whether to adopt a technology based on its cost-effectiveness that can be compared with an external willingness-to-pay threshold.

In relation to child health care, economic analyses have informed insurance plans, copayments, cost-effectiveness ratios of screening programs, and prophylaxis. The Canadian-based Pediatric Economic Database Evaluation initiative contains over 2600 full economic evaluations published from 1980 to 2013.⁴ An overview on methodologic problems can be gathered from the textbook by Ungar et al on child health and economics.⁵

Major Problems When Applying Health Economics to Child Health

In many health economic analyses, the QALY is used as an outcome measure. The rationale is to fuse gains in life expectancy and alterations in quality of life into one common denominator. Thus, the cost-effectiveness of decisions are comparable across interventions and populations (Figure; available at www.jpeds.com). A rather strict

DRG	Diagnosis-related group
QALY	Quality-adjusted life year

From the ¹Institute for Quality and Efficiency in Health Care (IQWiG), Köln, Germany; ²Child Health Department, Bath, United Kingdom; ³European Paediatric Association (EPA-UNEPSA); ⁴Bundesverband Managed Care e.V., Berlin; ⁵Institute of Epidemiology, Social Medicine, and Health Care Research, Hannover Medical School, Hannover, Germany; ⁶Institute of Pediatrics and Pediatric Residency Program, University of Foggia, Foggia, Italy; and ⁷Children’s Hospital, Hannover Medical School, Hannover, Germany

The authors declare no conflicts of interest.

0022-3476/\$ - see front matter. Copyright © 2015 Elsevier Inc. All rights reserved.
<http://dx.doi.org/10.1016/j.jpeds.2015.06.056>

application of the QALY in the sense that “all gains are equal across a population” may penalize children.⁶ Also, these quality of life values—usually referred to as “utilities”—may have to be elicited from proxies, often from parents, rather than directly from the children themselves. There are different ways to remediate these limitations besides not using the QALY at all,⁷ which has been the case in some European countries. Nord proposed the saved young life equivalent as a measure that includes distributional and ethical criteria.⁸ Also, priority can be given to child health when results from health economic evaluations are compared by putting additional weight on a QALY gained by children.

Another problem particularly virulent in economic analysis of child health is that the time horizon is especially long, particularly with the analysis of preventative interventions such as human papilloma virus vaccinations, and reducing risky life styles such as binge drinking, where the gains will be accrued in a time far into the future. Moreover, nobody can foresee whether future innovative interventions could make our current analysis irrelevant.

A similar issue is raised when choosing discounting values. The underlying concept can be explained as “financial resources gain interest.” These “benefits” may fall into different future years. The same holds for costs. Now, any investor would have to compare expenses and returns from various years to 1 base year in order to select the best investment strategy. Therefore, discounting is applied to make investment strategies comparable. Yet, in child health care, interventions with high costs often have to be paid now, with the effects (the returns on this investment) materializing only in the distant future. With discounting, the future effects will shrink, but the present costs remain in toto.

The Economic Health Care Model: Cornerstones

Understanding microeconomics provides understanding about how individuals make health-related decisions—whether to buy multivitamins or a better diet. Macroeconomics analyze the entire economy to understand how society makes decisions and distributes resources, including the balance between taxes and benefits, employment, business subsidies, and healthcare spending.

Although basic child health economic models should be applicable across all European countries, resources and costs will vary because of differing investment strategies relating to the determinants of health and the preexisting diversity of child health care service systems.

Effective health economic modeling for children’s care requires: (1) robust and valid data on the status quo and the effect of existing interventions; (2) valid quality and outcome measures, which include mortality, morbidity, and health related quality of life, education achievement, and other outcomes such as the health of the whole family; (3) a health economic framework based on child rights and equity considerations; (4) health insurances and providers amenable

to change; and (5) engagement of politicians and other stakeholders at a national and European level.

Major Steps to be Taken by Care Providers

Pediatricians and nurses should receive training in public health, health economics, and systems thinking to understand strengths and limitations of health economics and health economic analyses in order to participate in resource allocation decisions.

In 2010, the European Paediatric Association survey revealed that the DRG system was used in 23 out of 46 European countries (unpublished data) and that heads of pediatric departments were involved in managing their departments’ budget in 57% (24 of 42) of European countries. Presidents of national pediatric associations of 37 of 40 countries (90%) affirmed regular concerns from the heads of pediatric departments regarding the infrastructure costs (eg, personnel, diagnostics, therapeutics, investments, supplies) compared with the incomes for their units.

Participation of pediatricians in planning, financing, and decision making should be encouraged in child health care provision. Additional costs related to children compared with adult DRGs, such as hospital school, kindergarten, speech therapists, psychologists, social workers, career advisers, playgrounds, admission of parents, and meals for parents should be included when costing care. The potential of age-adjusted DRGs should be investigated because young children and their families may need extra interventions at different ages.

In order to effectively advocate for children and families, pediatricians in positions of influence within political systems also need to have a good understanding of macroeconomics to reduce the numbers of children and families living in poverty, which has many adverse impacts on health.

Conclusions

Health economics is not the enemy of child-friendly health care, which depends, in part, on better investment in the provision of social, environmental, and medical determinants to improve health (Table; available at www.jpeds.com). Health economics is an emerging science with a considerable relevance to health care in general and in particular child health care. Although some experts debate on the importance of health economic evaluations, all stakeholders must be aware of the strengths and limitations of a health economic approach when making decisions within health economics. Health economics is one of many elements within decision-making, which is particularly important in times of austerities, rationing, and difficult prioritization within health care systems. A simple strategy of avoidance and thus evading a discussion on costs, value, and economic evaluation related to health is no longer tenable. It thus remains an open question how long the value of health economics can be withheld from child health care. ■

References available at www.jpeds.com

References

1. Council of Europe. Declaration - 9th Council of Europe Conference of Health Ministers, 29 to 30 September 2011, Lisbon, Portugal 2011 [updated September 2011;08.05.2015]. <http://www.coe.int/t/dg3/>. Accessed July 9, 2015.
2. Zweifel P, Breyer F, Kifmann M. Health economics. 2nd ed. Heidelberg: Springer; 2009.
3. Gold MR, Siegel JE, Russell LB, Weinstein MC, eds. Cost-effectiveness in health and medicine. New York, Oxford: Oxford University Press; 1996.
4. Research Institute at The Hospital for Sick Children. PEDE - About the Database [updated 31.12.2013;08.05.2015]. <http://pede.ccb.sickkids.ca/pede/database.jsp>. Accessed July 9, 2015.
5. Ungar WJ, ed. Economic evaluation in child health. USA: Oxford University Press; 2009.
6. Ungar WJ, Prosser LA, Burnett HF. Values and evidence colliding: health technology assessment in child health. *Expert Rev Pharmacoecon Outcomes Res* 2013;13:417-9.
7. Arnesen T, Trommald M. Roughly right or precisely wrong? Systematic review of quality-of-life weights elicited with the time trade-off method. *J Health Serv Res Policy* 2004;9:43-50.
8. Nord E. An alternative to QALYs: the saved young life equivalent (SAVE). *BMJ* 1992;305:875-7.

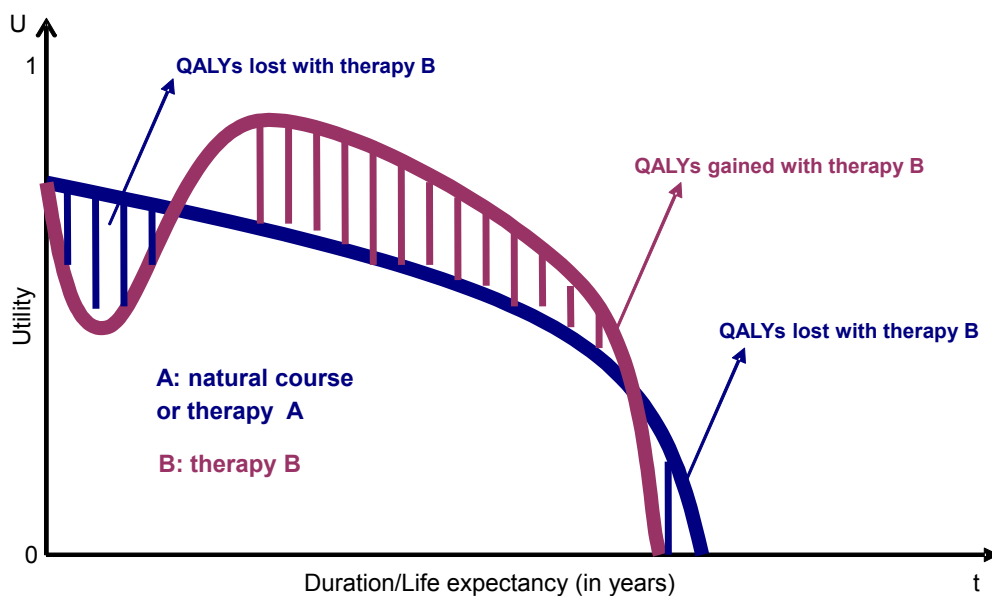


Figure. The QALY is a product of quality of life and length of life/life expectancy. QALYs are treated as equal regardless of when they accrue and who wins them.

Table. Economic contribution health and well-being of children

1. Social determinants (approximately 85% of total costs) to protect children from harm and promote their physical and mental well-being.

Contributors include the state, communities, school and environment, families, and others (eg, the European Union, banks, industry), based upon corporate, personal, and international social responsibility and action.

2. Health service determinants (approximately 15% of total costs) to prevent diseases and to provide pediatric care.

Contributions include health promotion programs, screening, immunization, emergency care, etc., based upon transfer of medical and economic knowledge from theory into practice.